BRITISH COLUMBIA

MINISTRY OF FORESTS

Tree Farm Licence 57

Issued to Iisaak Forest Resources Ltd.

Rationale for Allowable Annual Cut (AAC) Determination

Effective January 1, 2005

Ken Baker

Deputy Chief Forester

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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 the first area-based determination, under Section 8 of the *Forest Act* and the *Tree Farm License Area-based Allowable Annual Cut Trial Program Regulation*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 57. This document also identifies where new or better information is needed for incorporation into future determinations.

Description of the TFL

TFL 57, held by Iisaak Forest Resources Ltd. ('the licensee'), is located on the west side of Vancouver Island and lies completely within the area covered by the provincial government's 1993 Clayoquot Sound Land Use Decision (CSLUD).

The Clayoquot Sound area is a complex of mountains, valleys, oceans, inlets, lakes, rivers, islands and forests. During the last decade plans to integrate resource use with conservation of natural values in the area have attracted international attention. The 1993 CSLUD followed many years of public participation and consultation regarding land and resource use planning in the area. The CSLUD designated portions of Clayoquot Sound as protected areas, special management areas (for recreation, wildlife, or scenic corridors) and general integrated resource management areas. Under the CSLUD, the general management areas were intended to include timber harvesting as a major use.

TFL 57 has a gross area of 87 393 hectares and covers approximately 32 percent of the total area under the CSLUD. 74 426 hectares (85 percent) of the area covered by TFL 57 are considered to be productive forest. The remainder includes 3555 hectares (four percent) on Meares Island, where timber harvesting is prevented by a court injunction, and 9412 hectares (eleven percent) composed largely of non-productive areas, rock, lakes, and swamp. The land base currently considered available for timber harvesting is 26 885 hectares or thirty-six percent of the total forested area.

On October 22, 1993, with the objective of defining world-class, sustainable forest practices for the area, the provincial government announced the formation of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound (the Scientific Panel). The Scientific Panel was tasked with reviewing the forest practices standards in effect in Clayoquot Sound at that time, and recommending changes to ensure that the practices would be sustainable. On May 30, 1995, the Scientific Panel submitted to government a three-volume report containing a total of 124 specific and 91 general recommendations on forest practices and First Nations issues in Clayoquot. On July 6, 1995, the provincial government issued a joint news release from the Ministry of Forests (British Columbia Forest Service, BCFS) and the former Ministry of Environment, Lands and Parks (MELP), announcing acceptance of the Scientific Panel's report and government's intention to fully implement the report's recommendations.

Clayoquot Sound has an extensive First Nations cultural history, and the TFL includes traditional territories claimed by several First Nations represented by the Nuu-chah-nulth

Tribal Council. In March 1994, a two-year Interim Measures Agreement between the provincial government and hereditary chiefs of the Nuu-chah-nulth Central Region Tribes was signed. This lead to the establishment of the Clayoquot Sound Central Region Board (CRB) as part of a joint management process between First Nations and provincial government appointees, to oversee development in Clayoquot Sound, including implementation of the CSLUD and the recommendations of the Scientific Panel. In April 1996, the agreement was extended for a three-year period as the Interim Measures Extension Agreement (IMEA). After being extended to March 2000, a new agreement, the Interim Measures Extension Agreement: a Bridge to Treaty was signed in March 2000 for a term of five years or the effective date of a treaty, which ever occurs first. The planning of all operations for TFL 57 is covered by the CSLUD and must be reviewed by and coordinated through the Central Region Board.

Simultaneously, government appointed a Clayoquot Sound Implementation Team—which included representation from the Ministries of Forests; and the former ministries of Environment, Lands and Parks; Small Business, Tourism and Culture; and Aboriginal Affairs—to set in motion the implementation of the Scientific Panel's recommendations. This team collaborated with the Central Region Board to develop a planning framework with input from government officials, elected local governments, labour, forest licensees, and environmental groups. This process established the Clayoquot Sound Planning Committee—comprised of the Central Region Board plus one representative from each of the ministries mentioned above—to coordinate all planning activities in Clayoquot Sound in accordance with the recommendations of the Scientific Panel and provincial legislation.

The implementation team has now been dismantled. The Clayoquot Sound Technical Planning Committee, consisting of representatives from First Nations and government has been formed in order to carry out the technical duties associated with watershed planning. Under the direction of this committee, watershed-level plans are to be prepared for each of the fifteen watershed planning units delineated in Clayoquot Sound. Twelve of the fifteen watershed planning units contain parts of TFL 57. Of these, three have been formally endorsed by the signatories to the IMEA and the remaining nine are scheduled to be substantially complete and ready for consideration by the signatories to the IMEA by March 2005.

Most of TFL 57 is situated within the Coastal Western Hemlock (CWH) biogeoclimatic zone. Commercial tree species include western hemlock, western redcedar, and amabilis fir (balsam). Minor volumes of Sitka spruce, Douglas-fir, yellow-cedar, and pine also occur on the TFL.

The licensee manages operations in the TFL from Ucluelet, and the TFL is administered by the BCFS from its South Island Forest District Office in Port Alberni.

History of the TFL and the AAC

Harvesting and sawmilling have occurred for over a century in the area now covered by TFL 57. In 1955, Forest Management Licenses (FML) No. 20 (Tofino) and 21 (Alberni)

were awarded to MacMillan Bloedel Limited's predecessor companies. FMLs were later renamed Tree Farm Licenses.

In 1984, the two TFLs were combined to form TFL 44. In October 1999, TFL 44 was subdivided and most of the Clayoquot portion of the TFL became TFL 57 and was transferred to Iisaak Forest Resources Ltd. on October 27, 1999.

In 2000, a new AAC of 123 800 cubic metres was determined for TFL 57, of which 110 390 cubic metres are available to the licensee and 13 410 cubic metres to the BC Timber Sales.

New AAC determination

Effective January 1, 2005, the new area-based AAC for TFL 57 is 381 hectares, of which 92 hectares is attributed to even-aged harvesting operations, and the remaining 289 hectares to uneven-aged harvesting operations.

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* or the trial program is terminated under Section 7 of the *Tree Farm Licence Area-based Allowable Annual Cut Trial Program Regulation.*

Information sources used in the AAC determination

- *Timber Supply Analysis Information Package for TFL No. 57*, accepted June 27, 2002;
- *Volume-Based Timber Supply Analysis for TFL 57*, submitted December 30, 2002;
- *Volume-Based Timber Supply Analysis for TFL 57 Addendum*, submitted August 28, 2003;
- *Area-Based Timber Supply Analysis for TFL 57*, accepted June 16, 2004;
- Existing stand yield tables for TFL 57, accepted by MSRM, Land Information Services Division, December 8, 2003;
- Managed stand yield tables and site index curves, accepted by BCFS Research Branch, August 13, 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 No. 57, Twenty-year Plan, Iisaak Forest Resources Ltd., June 10, 2004;
- Letter from the Central Region Board to South Island Forest District, dated August 12, 2004 regarding its recommended approval of *Management Plan No. 1: TFL 57*;
- *Management Plan No. 1: TFL 57*, Iisaak Forest Resources Ltd., approved September 22, 2004;
- Summary of Public Input solicited by the licensee regarding the contents of Management Plan No. 1;

- *Record of the administrative adjustment of the allowable annual cut for TFL 44 and TFL 57*, Deputy Chief Forester, January 31, 2000;
- 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 Minister of Forests, September 17, 1996, to the chief forester, stating the Crown's economic and social objectives regarding Clayoquot Sound;
- 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;
- *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;
- *Landscape Unit Planning Guide*, BCFS and MELP, March 1999;
- *Order Establishing Provincial Non-Spatial Old Growth Objectives*, June 30, 2004;
- Forest Practices Code of British Columbia Guidebooks, BCFS and MELP;
- *Forest and Range Practices Act*, consolidated to November 2002;
- *Forest Planning and Practices Regulation*, current as of January 31, 2004;
- *Identified Wildlife Management Strategy*, BCFS and MELP, February 1999;
- *Sustainable Ecosystem Management in Clayoquot Sound: Planning and Practices (Report 5)*, Scientific Panel for Sustainable Forest Practices in Clayoquot Sound, 1995;
- *Bedingfield Watershed Plan*, Clayoquot Sound Technical Planning Committee, October 2003;
- *Cypre Watershed Plan*, Clayoquot Sound Technical Planning Committee, October 2003;
- *Flores Island Watershed Plan*, Clayoquot Sound Technical Planning Committee, October 2003;
- 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 July 6, 2004;
- *Area-Based Allowable Annual Cut Determination Recommended Information Requirements for Tree Farm Licences*, November 2002; and
- *Defining the Boundary and Content of a Disturbance*, B.C. Forest Service, January 2003.

Role and limitations of the technical information used

Section 8 of the *Forest Act* and section 4 of the *Tree Farm Licence Area-Based Allowable Annual Cut Trial Program Regulation* require the chief forester to consider biophysical as well as social and economic information in AAC determinations. A timber supply analysis, and the inventory and management practices information 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 57, 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* and Section 4 of the *Tree Farm Licence Area-Based Allowable Annual Cut Trial Program Regulation* requires the chief forester to consider particular factors in determining area-based AACs for TFLs. Sections 8 and 4 are reproduced in full as Appendix 1 and Appendix 2 respectively.

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* and section 4 of the *Tree Farm Licence Area-Based Allowable Annual Cut Trial Program Regulation* (Area-Based AAC Regulation).

The chief forester has expressed the importance of consistency of judgment 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 57.

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. 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) re-determining AACs frequently, in cases where projections of short-term timber supply are not stable, to ensure they incorporate current information and knowledge — a principle that has been recognized in the legislated requirement to re-determine these 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 with respect 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—'the Code'—which is now in transition to the Province's *Forest and Range Practices Act*.

In many areas the timber supply implications of some legislative provisions, such as those for landscape-level biodiversity, remain uncertain, particularly when considered in combination with other factors. In each AAC determination I take this uncertainty into account to the extent possible in context of the best available information.

As British Columbia progresses toward completion of strategic land-use plans, in some cases the eventual timber supply impacts associated with the land-use decisions resulting

from various regional and sub-regional planning processes remain subject to some uncertainty before formal approval by government. In determining AACs it has been and remains my practice not to speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government.

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to fully analyze and account for the consequent timber supply impact in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring for instance 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. In such cases the legislated requirement for frequent AAC reviews will ensure that future determinations address ongoing plan-implementation decisions. Wherever specific protected areas have been designated by legislation or by order-in-council, these areas are deducted from the timber harvesting land base and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting other objectives, for example for biodiversity or community watersheds.

Where appropriate, I will consider information on the types and extent of planned and implemented intensive silviculture practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of their timber supply effects.

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 re-determine 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 Section 8 of the *Forest Act*, under the Code, and under the new *Forest and Range Practices Act*.

Because the new regulations of the *Forest and Range Practices Act* are designed to maintain the integrity of British Columbia's forest stewardship through responsible forest practices, it is not expected that the implementation of the legislative changes will significantly affect current timber supply projections made using the Code as a basis for definition of current practice.

Specific to determining an area-based AAC under the Tree Farm Licence area-based allowable annual cut trial program, I note that the main focus of the trial program is testing the efficacy of regulating harvest levels by area rather than volume. The timber supply analysis and my considerations in this AAC determination are consistent with the direction from the *Tree Farm Licence Area-Based Allowable Annual Cut Trial Program Regulation*.

Guiding principles with respect to First Nations

With respect to First Nations' issues, I am aware of the Crown's legal obligations resulting from recent decisions in the Supreme Court of Canada. The AAC that I determine should not in any way be construed as limiting the Crown's 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 57. It is also independent of any decision by the Minister of Forests with respect to subsequent allocation of the wood supply.

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 re-iterate 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.

Subsequent to a 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* and Section 4 of the *Tree Farm Licence Area-Based Allowable Annual Cut Trial Program Regulation* 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 TFLs.

For an area-based 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, rate of timber growth, and management practices. Using this set of data and a computer model, a flat-line area harvest forecast is produced.

This is known as the 'base case' forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply.

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 and Range Practices Act, 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 57 was first prepared by Rowe Forest Management Ltd. using FSSIM – Forest Service Simulator, version 3.0, with technical data development by Timberline Forest Inventory Consultants.

The data were originally organized to facilitate a volume-based timber supply analysis, notwithstanding that the Scientific Panel recommendations are area-based. Subsequently Iisaak Forest Resources Ltd. agreed to fully participate in the TFL area-based AAC trial program. BCFS staff assisted the licensee by modifying the data used in the volume-based analysis for the licensee's use in conducting an area-based analysis using FSSIM, version 3.0.

Based on previous AAC determinations for other TFLs, I am familiar with the FSSIM model used for the analysis, and I am comfortable that the output provides a sound basis for AAC determinations. I am therefore satisfied that the base case prepared by the licensee is an acceptable starting point for this determination.

The area-based analysis was conducted following recommendations in the document *Area-Based Allowable Annual Cut Determination: Recommended Information Requirements for Tree Farm Licences* for omitting or simplifying certain factors that are normally considered in a timber supply analysis. The following factors were omitted in this analysis:

- Growth and yield estimates for clearcut and partial harvesting systems;
- Estimates of decay, waste and breakage;
- Estimates of endemic losses (operational adjustments);
- Stand-level volume reductions (e.g. wildlife tree retention);
- Timber volume adjustments;
- Utilization standards;
- Volume of non-recoverable losses.

The timber supply analysis included assumptions based on the licensee's assessment of the best available information on current forest management and the land base available for timber harvesting 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. 1.

Where I have concluded that an assumption was appropriately modelled 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. 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, or a high level of public input.

In the base case, the licensee projected an even-flow harvest level of 375 hectares per year with an approximate contribution of 100 hectares per year of even-aged management and 275 hectares per year of uneven-aged management over 250 years.

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 57 in this determination.

Consideration of factors as required by Section 8 of the *Forest Act,* as varied by *Section* 4 of the *Tree Farm Licence Area-based Allowable Annual Cut Trial Program Regulation*

The *Regulation,* Section 4 (1) states:

> **When determining the allowable annual cut for a trial management unit, the chief forester, in addition to the matters set out in section 8 (8) (b) to (e) of the Act, must consider the rate of harvesting, based on the amount of land from which timber is to be harvested annually, that may be sustained within the trial management unit, taking into account the following factors, which replace the factors set out in section 8 (8) (a) (i) to (vi) of the Act**

(a) **The composition of the forest within the trial management unit and its expected rate of growth**

Land base contributing to timber harvesting

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.

The total area of the TFL, including area on Meares Island is 87 393 hectares. The current timber harvesting land base derived during the analysis for TFL 57 was 26 885 hectares, after deductions in respect of factors noted in this section.

I have considered all of the deductions applied in the derivation of the timber harvesting land base for TFL 57 assumed in the base case. I accept the deductions applied to account for non-forested areas, non-productive areas, areas with low timber growing capacity, and areas covered with non-commercial brush. All of these factors are described in the licensee's information package, and I will not discuss them further in this document.

- *Meares Island*

Since 1985, Meares Island has been subject to a court injunction preventing all timber harvesting on the island. In 1994, the court action was adjourned indefinitely with the injunction in force.

Meares Island was not included in the provincial government's 1993 CSLUD, and completion of a watershed level plan for the area in accordance with the recommendations of the Scientific Panel is a low priority.

In my guiding principles for AAC determinations, I indicate that in the absence of any formal designation of protection, such an area would normally be considered to contribute to timber supply. However, in view of the longevity of this injunction, in this AAC determination I have assumed no timber supply contribution from Meares Island in order to ensure that the continued avoidance of harvesting on the island will not result in an undue increased rate of harvesting elsewhere in the TFL.

Under the Clayoquot Sound planning framework, Meares Island is designated as one watershed planning unit. The watershed-level plan for this area has not yet been initiated. No change is expected for the status of this area in the short term. Should the watershed-level plan be completed in the future, and should the injunction be removed, this area may once again contribute to timber supply and be factored into future analyses. For the purposes of this determination, I am satisfied that there are no risks posed to timber supply as a result of the assumptions used in the analysis.

The exclusion of Meares Island results in a reduction of 3555 hectares to the land base of TFL 57.

- economic and physical operability

Those portions of the TFL which are not physically accessible for harvesting, or which are not feasible to harvest economically, are categorized as inoperable and are excluded when deriving the timber harvesting land base.

Operability mapping, including consideration of both economic and physical operability, was completed for the TFL in 1993 by MacMillan Bloedel Ltd. and provided to Iisaak when TFL 57 was subdivided from TFL 44.

In the timber supply analysis, 7070 hectares were excluded from the timber harvesting land base to account for areas classified as physically inoperable for harvesting by current methods (i.e., where the land is so steep or rocky or both, that trees may not be safely felled or yarded, or a significant portion of the timber volume could not be recovered).

Similarly, 3910 hectares of mature timber were excluded from the timber harvesting land base as currently uneconomic to harvest.

I am aware that the licensee has categorized 4.7 percent of the future timber harvesting land base as being marginally economic. In part because there has been very little harvesting on the TFL in recent years, I have not been provided with any data to support the definition of marginally economic timber used in the analysis, nor documentation that any harvesting has in fact taken place in the marginally economic timber. I am aware that this introduces uncertainty in this determination, however it is not clear if the assumed economic criteria constitute an over-, or underestimate of the current timber harvesting land base. I request that the licensee undertake an operability review for TFL 57 for the analysis leading to the next determination, and I have included this request under "Implementation".

Based on my review of the assumptions incorporated in the analysis and my knowledge of the TFL area, combined with the fact that the South Island Forest District supports the approach and data used in the analysis, for this determination I accept the current estimates of economic and physical operability as a reasonable approximation of the total operable land base in TFL 57.

- hydroriparian considerations

The hydroriparian ecosystem is comprised of waterbodies and the immediately adjacent terrestrial environment. Following the recommendations of the Scientific Panel, a hydroriparian inventory was completed for most of the Clayoquot Sound on 1:20 000 TRIM maps. Management Plan No. 1 indicates that 1:15 000 aerial photographs and ground truthing were also used to delineate the hydroriparian reserves.

For the few areas where the inventory was not yet complete, a 13 percent deduction for stream hydroriparian reserves was based on the average of the four then substantially completed watershed planning units. The land base reduction applied using the classification and consideration for the unclassified areas was 10 159 hectares after other, previous reductions.

District staff confirm the hydroriparian areas agree with the prescriptions in the Scientific Panel's report, *Sustainable Ecosystem Management in Clayoquot Sound: Planning and Practices (Report 5) (*Scientific Panel Report). The Department of Fisheries and Oceans found the provisions in the draft Management Plan No. 1 to adequately address fisheries and riparian concerns.

I note that the provision for hydroriparian reserves exceeds the requirements of the *Forest Planning and Practices Regulation* of the *Forest and Range Practices Act*, but that those provisions accord with the recommendations of the Scientific Panel. The Panel's recommendations are unique to Clayoquot Sound and the licensee is committed to them by way of stipulations in the TFL document. For the purposes of this determination, I am satisfied that the deductions for hydroriparian reserves applied in the base case were appropriate.

- terrain and soils considerations

For the analysis, the licensee accounted for terrain and sensitive soils information derived from a number of inventories – terrain stability class mapping, terrain mapping, and terrestrial ecosystem mapping – gathered through the Clayoquot Sound Resource Inventory project. For areas not covered by these inventories – part of the Tofino/Tranquil, Kennedy Lake, and Upper Kennedy Watershed Planning Units – the older MacMillan Bloedel terrain stability mapping was used. Only terrain Class V was identified in this old mapping. Based on these inventories and watershed plan reserve criteria, a total of 5667 hectares were excluded from the timber harvesting land base for areas identified as very unstable terrain and sensitive soils.

For the purposes of this determination, I am satisfied that the reductions for unstable terrain and sensitive soils were appropriate. I will discuss further the reductions for Class IV terrain in *stand-level retention*.

- watershed plan reserves

Watershed plans are being developed according to the principles and recommendations of the Scientific Panel to guide operations in Clayoquot Sound. These plans include mapping and designation of specific areas as reserves to protect a range of forest values. Mapped reserves are available for three completed watershed planning units (Bedingfield, Cypre, Flores) and Tofino/Tranquil, which has a substantially completed watershed plan. These four watershed planning units cover approximately 50 percent of the total TFL 57 area.

All four planning units have completed terrestrial ecosystem mapping. I have examined unstable terrain under *terrain and soils considerations*. Additional reserves are designated for protecting habitats of red- and blue-listed ecosystems, and for ensuring ecosystem representation. The plans also include reserves for recreation areas, which will be discussed under *recreation*.

The following process was used to determine the area reduction for ecosystem reserves. A list of red- and blue-listed plant communities provided by the BC Conservation Data Centre was used to identify the associated BEC site series from the terrestrial ecosystem mapping. All mature forest areas in red-listed ecosystems were reserved within the Bedingfield, Cypre, Flores, and Tofino/Tranquil planning units. An average of the percentage reduction from these four units (0.24 percent) was then applied to areas without terrestrial ecosystem mapping (Clayoquot River, Kennedy Lake and smaller portions of other units in the southern part of the TFL). Mature areas for 50 percent of the blue-listed ecosystems were reserved in the Bedingfield, Cypre, Flores and Tofino/Tranquil planning units. The average percent reduction in the four units (1.5 percent) was then applied to areas without watershed plans. A total of 940 hectares in red- and blue-listed reserves was removed from the productive forest land base in the derivation of the timber harvesting land base.

Thirty percent of the total area in each BEC site series was reserved for continued ecosystem representation within the Bedingfield, Cypre, Flores and Tofino/Tranquil planning units. An average of the percent reduction within the four units (9.1 percent) was applied to areas without watershed plans. A total of 3824 hectares for ecosystem representation was excluded from the timber harvesting land base.

District staff confirm that the Scientific Panel recommendations were followed in the development of the watershed plans, and that the approach for extrapolating ecosystem reserves to unmapped watersheds is reasonable. I accept the way in which areas have been reserved in accordance with completed watershed plans, and the way in which that information was extrapolated to areas where watershed plans have not yet been completed. For the purposes of this determination, I am satisfied that the assumptions used in the base case were adequate, and have made no adjustments on this account.

- *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*

According to the licensee, roads in the TFL have been mapped primarily as lineal features. It contends that it is difficult to extract a reliable estimate of polygon area in roads from the Vegetation Resource Inventory (VRI). Based on past experience on

TFL 57 and in adjacent management units, the licensee estimated that the area occupied by existing roads, trails, and landings (classified and unclassified), covers 4 percent of harvested areas. For the analysis the licensee deducted 4 percent from the area in the timber harvesting land base covered with stands younger than 60 years old. The total area in TFL 57 determined to be occupied by existing roads, trails and landings was 1587 hectares.

In the absence of better information, and noting that this estimate for the total area of existing roads, trails, and landings is consistent with past experience in this TFL and with adjacent management units, I accept the assumptions used in the base case as adequate for this AAC determination.

I request that licensee collect local field data on the width of roads constructed on the TFL for use in future determinations.

2) future roads, trails and landings

In the timber supply analysis, to account for future roads, trails and landings in areas harvestable by conventional systems, a 5-percent area reduction was applied to mature stands (i.e., aged 60 years and older). This reduction is consistent with the recommended maximum percentage of harvestable area designated for permanent access in the Scientific Panel Report.

I have reviewed and discussed the information regarding future roads, trails, and landings with BCFS staff, who agree with the reductions applied. I have therefore considered this estimate to be reasonable for use in this determination.

- deciduous-leading stands

Deciduous species on TFL 57 include alder and maple. In the base case, 505 hectares of the forested area of the TFL were excluded from the timber harvesting land base specifically for deciduous-leading stands.

Public comment submitted by the Central Region Board included a recommendation that alder and maple species should be utilized. Although these stands are available for harvest to the licensee, given the lack of harvesting performance in these stands, 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.

<u>Existing forest inventory</u>

- general comments

The most recent forest inventory (Vegetation Resource Inventory) for areas now comprising most of TFL 57 was completed in 1997 as part of the Clayoquot Sound Resource Inventory Initiative. The inventory has not been updated for depletion resulting

from harvesting; however, there has been very little logging in the TFL since 1998. In the analysis, since stands have not been projected for forest growth since the original inventory, the assumed start date is 1998.

Other inventories completed in 1999 under the Clayoquot Sound Resource Inventory Initiative include terrain mapping, a hydroriparian inventory, terrestrial ecosystem mapping, a visual landscape inventory, and a recreation features inventory. I note that these inventories have been carried out following the Scientific Panel Report recommendations to enable an ecosystem-based approach to forest planning.

In considering that the forest inventory data for the TFL area have not been updated since 1998, I note that this factor could be significant to this determination to the extent that the estimated ages of timber across the TFL are in error. If the assumed age-class distribution were significantly inaccurate, such error could lead to significant misrepresentation of the area available for harvest at any point in time. Given the reduced harvesting activity on the TFL since 1998, I do not believe there are any significant data errors in this regard. I therefore accept the inventory data as the best available information and, as such, suitable for the purposes of my determination.

- age class structure

Approximately 74 percent of the stands in the timber harvesting land base are 140 years or more in age. A further 25 percent of stands in the timber harvesting land base are less than 60 years of age. Less than one percent of stands, or approximately 168 hectares, are currently between 60 and 140 years of age.

- species profile

The predominant tree species within TFL 57 are western redcedar, western hemlock, amablis (balsam) fir, and yellow cedar. Stands are typically composed of mixed species. A small portion of the land base is covered with managed hemlock, Douglas-fir and western redcedar leading stands less than 40 years of age.

- harvestable area versus timber harvesting land base

In the watershed plans, once all reserve areas are mapped, the remaining area outside reserves is designated as the harvestable area. The timber harvesting land base is significantly smaller than the harvestable area due to the additional, operations-related reductions applied for operability and unmerchantable stands.

I note for the purposes of this determination that the harvestable area and the timber harvesting land base are not synonymous, and that there can be a considerable size difference between them.

- aggregation and existing stand yields

I have reviewed the aggregation methods used in the analysis and concur with those methods. I am also aware that an error exists in the base case insofar as an *Abies* species appears to have been mis-classified when estimating yields for existing stands. However, because existing stand yields have no bearing on area-based AAC determinations, I consider this issue not relevant to this determination.

Expected rate of growth

I have reviewed the procedures used in the analysis for aggregating individual stands into analysis units for managed stands and am satisfied that the assumptions for these factors appropriately reflect conditions on TFL 57.

- regenerated stand yields

In the analysis all forest stands younger than 40 years of age were assigned to a managed stand yield table. Fir- and cedar-leading stands are planted while hemlock-leading stands regenerate naturally. District staff inform me that although deer browse is a concern, cedar regeneration has been successful.

For area-based analysis, regenerated stand growth estimates are only needed to determine the minimum harvestable ages to be used in the analysis.

- variable-retention silvicultural system

There are no existing complex stand yield tables for TFL 57, and reported volumes are not a consideration when determining an area-based AAC.

- site index

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, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size, all of which are important factors in determining area-based harvest levels.

For the original volume-based analysis site index estimates for all stands were calculated from forest cover attributes (stand height and age) by Ministry of Sustainable Resource Management staff. As discussed below under *minimum harvestable ages*, the minimum harvestable ages of two analysis units were derived using adjusted site index estimates from *Working Paper 37, Site index Adjustments for Old-growth Stands Based on Paired Plots.* I note that better estimates of site index for old-growth stands are now possible and, I therefore encourage the licensee to consider doing Site Index/BEC (SIBEC) work

or ground sampling to improve its estimates of productivity because this factor can have a significant impact on minimum harvestable age.

- *use of select seed*

The Forest Practices Code requires that the best genetic quality seed source available be used for reforestation. Better genetic quality (select) seed can be collected from superior natural stand provenances and seed orchards. Select seed sources are determined or developed through field trials, which are designed to identify naturally-occurring, broadly-adapted, healthy and vigorous trees capable of passing on their desirable genes. No genetic engineering is involved in these activities.

I conclude yield estimates are not relevant to an area-based AAC determination. However, I am aware that the genetic gains may have some bearing on green-up ages and minimum harvestable age.

- *minimum harvestable ages*

A minimum harvestable age is an estimate of the earliest age at which a forest stand has grown to a harvestable condition and has met minimum merchantability criteria. Minimum harvestable age assumptions affect when second-growth stands will be available for harvest. In practice, many forest stands will be harvested at much older ages than the minimum, due to constraints on harvesting which arise from managing for other forest values such as visual quality, wildlife and water quality.

In the timber supply analysis, minimum harvestable age estimates were defined by the greater of the following two criteria: the age at which a stand achieved 90 percent of maximum mean annual increment (MAI) or the age at which the stand reached a volume of 300 cubic meters per hectare (operational feasibility). Generally speaking the stands in TFL 57 are currently much older (greater than 250 years) than the minimum harvestable age.

In converting the licensee's volume-based analysis to an area-based analysis, BCFS staff suggested to the licensee that productivity was likely underestimated for sites with old forests and that this would affect minimum harvestable ages. In particular, staff were concerned about two analysis units that cover approximately 74 percent of the timber harvesting land base. Therefore, for the area-based base case, the licensee averaged the minimum harvestable ages for the two analysis units derived using base case estimates of site index and using adjusted site index estimates from *Working Paper 37, Site index Adjustments for Old-growth Stands Based on Paired Plots* (OGSI). As a result, the minimum harvestable age for the cedar analysis unit was reduced from 160 years to 110 years and for the hemlock/balsam analysis unit from 180 years to 120 years.

Based on my experience reviewing minimum harvestable age assumptions for AAC determinations on coastal units, I am satisfied that the partial OGSI adjusted minimum harvestable ages are more reasonable than the initial, higher ages assumed by the licensee.

In fact, the minimum harvestable ages assumed for other coastal units are generally even lower than those assumed after the OGSI adjustment.

I am aware that the base case flat-line projection of annual area to be harvested is constrained by the timber availability about 100 years from now. By coastal standards, this is a relatively long time period. I note that if in the future timber is in fact harvestable at younger ages than modelled, this would allow for more frequent harvest return intervals, and the possibility of higher harvest levels. Nevertheless, at this time I have no basis for concluding that minimum harvestable ages will in fact be younger than the modelled ages, but I do believe that experience in the long term will show the modelled ages to be too high.

For this determination, I accept the minimum harvestable ages as modelled in the base case.

(b) the expected time that it will take the forest within the trial management unit, excluding areas that no longer contribute to the productive forest land base, such as areas on which permanent access structure have been constructed, to become re-established after timber is cut, damaged or destroyed;

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.

- impediments to regeneration

In a conventional timber supply analysis, evaluation of the impediments to prompt regeneration provides an accounting of the areas where regeneration of trees following harvest would be difficult, and therefore an assessment of the uncertainty in the values used for regeneration delay and the time to reach a free-growing condition.

In the analysis, 112 hectares from the historic MacMillan Bloedel ESA mapping were removed to account for areas that would be difficult to regenerate.

The licensee notes some concern with regards to the treatment of hemlock stands with dwarf mistletoe, indicating that the traditional approach of clearcutting with a 2-3 metre knockdown of infected residual understory may need to be modified with variable retention harvesting.

Given the relatively short history the forest sector has with the use of variable retention silvicultural systems, it is difficult to predict the impacts of these systems on regeneration of harvested areas. When better information become available, it will be incorporated into future analyses. For the purposes of this determination, I have made no adjustment to account for areas where successful regeneration of trees is a problem.

(c) the silviculture systems and silviculture treatments to be applied within the trial management unit;

I have reviewed the assumptions applied in the base case regarding incremental silviculture and, to the extent that they affect minimum harvestable age, I am satisfied that they appropriately represent current practice. I will therefore not discuss this factor further in this rationale.

Silvicultural systems

The Scientific Panel recommends that the use of conventional silvicultural systems in Clayoquot Sound be replaced with the use of the variable retention silvicultural system. According to the recommendations, in cutting units with significant values for resources other than timber or with sensitive areas, at least 70 percent of the forest should be retained in a relatively uniform distribution. On cutting units without significant values for resources other than timber, or without sensitive areas, at least 15 percent of the forest should be retained.

In the analysis the licensee referred to areas with high retention levels as "uneven-aged management areas" and to all other areas as "even-aged management areas". Uneven-aged management assumptions were applied to two of the visual zones, amounting to approximately 50 percent of the timber harvesting land base. Even-aged management assumptions were applied on the remainder of the timber harvesting land base.

The *Tree Farm Licence Area-Based Allowable Annual Cut Trial Program Regulation* stipulates that the entire area affected by harvesting, including road rights-of-way, is considered to be the cutblock, no matter how many trees are left standing, excluding reserved areas.

I note that in the proposed Management Plan No. 1, the licensee commits to managing the available timber harvesting land base with variable retention silvicultural systems, consistent with the recommendations of the Scientific Panel.

I have reviewed the Scientific Panel recommendations for variable retention and am satisfied with modelling visual areas as the uneven-aged management regime, all other areas as the even-aged management regime. I will discuss this further under *visual landscape management* and *stand-level retention.*

(d) the constraints on the amount of land available for timber harvesting that reasonably can be expected from use of the trial management unit 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.

- rate of cut

For Clayoquot Sound, the common adjacency provisions are superceded by the Scientific Panel's recommended watershed level rate-of-cut of one percent of the total area of the watershed each year. For watersheds greater than 500 hectares in area, the rate-of-cut is adjusted to five percent over five years, while in watersheds 200-500 hectares in area, the rate-of-cut is ten percent in a ten-year period. For watersheds where the harvestable timber covers less than 30 percent of the total area, resource managers have some flexibility to alter the standard while still minimizing hydrological change. In TFL 57, 77 watersheds representing about 33 percent of the timber harvesting land base are in this category.

In the base case each of the 131 watersheds defined in accordance with the Scientific Panel Report were identified and for each of these watersheds the area available for harvest was determined in accordance with the Scientific Panel's watershed rate-of-cut recommendations described above. These areas were tracked in the model, ensuring adherence to the rate-of-cut parameters.

I have reviewed the information concerning hydrologic rate-of-cut and am satisfied that on this account the assumptions modelled in the base case reflect the intended practice in Clayoquot Sound.

- recreation

Recreational use of the Clayoquot Sound area is a significant consideration for planning. In accord with the Scientific Panel recommendations, the watershed-level planning process delineated 100-metre recreation reserves around the large lakes in Clayoquot Sound (Riley, Muriel, Kennedy, Pretty Girl and Adrienne). This information was incorporated in the hydroriparian reserves and the areas excluded from the timber harvesting land base.

Recreation resources are generally accounted for through other reserves, such as those along the marine shore and in hydroriparian areas. In accordance with recreation guidelines recently developed by the Clayoquot Sound Planning Committee, a recreation management zone, covering 2687 hectares of productive forest, has also been delineated. It includes areas within 70 metres of hydroriparian reserves around smaller lakes, within 300 metres along the marine shore (including the marine shore reserve) and within 150 metres of recreation reserves established to protect high value features such as waterfalls and trails.

Most of the areas in the recreation management zone overlap one of the three visual zones. Nevertheless, in the base case a constraint developed by the licensee was applied over this zone to ensure 65 percent of the productive forest area was retained in the model with stands on denuded areas having attained six metres in height before adjacent areas could be harvested.

Public input from the Friends of Clayoquot Sound suggested specifying a 70 percent retention level in the recreation management zone. As noted above, most of the area overlaps visual zones with high levels of retention. In addition, district staff agree that the assumptions used in the base case are reasonable.

I have considered the public input received and note that when the overlap of the recreation management zone with the visual zones is considered, the difference between the modelled retention levels and the levels suggested by the Friends of Clayoquot Sound are quite small. For the purposes of this determination, I am satisfied that the assumptions for recreation management applied in the base case adequately represent intended management on TFL 57.

- *biodiversity*

Biological diversity, or 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. In Clayoquot Sound, biodiversity at the stand and landscape level is based on the Scientific Panel recommendations, rather than the *Landscape Unit Planning Guide* and the *Old Growth Order.*

- *landscape-level biodiversity*

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.

For Clayoquot Sound, the Scientific Panel recommended that at least 40 percent of the forest in each watershed-level planning unit be retained in age classes 8 and 9 (old growth). A significant portion of this requirement is met through forest outside the timber harvesting land base in each watershed, such as hydroriparian reserves, blue- and red-listed ecosystem reserves and reserves for ecosystem representation.

Public input included the comment that Iisaak should retain more than the 40 percent minimum of old forests recommended by the Scientific Panel. I note that in many areas

in the TFL more than 40 percent will be retained due to the amount of reserves and inoperable forest.

I have reviewed the information pertaining to landscape level biodiversity management on TFL 57 and am satisfied that in this regard the base case appropriately accounts for the Scientific Panel's recommendations.

- *stand-level retention*

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. For most of British Columbia, the minimum requirements for wildlife tree retention are set out in the *Forest Planning and Practices Regulation*. In Clayoquot Sound, management for structural diversity and habitat elements is accounted for within the recommendations of the Scientific Panel regarding the variable retention silvicultural system. The use of that system protects a variety of values and ecosystem components in managed forests, including culturally important sites, scenic and recreational values.

The Scientific Panel recommendation for cutting units that are not on sensitive sites and without significant values for resources other than timber is to retain at least 15 percent of the forest. As described above under *Silvicultural systems*, in the base case these areas were categorized as even-aged management areas. In cutting units with significant values for resources other than timber or with sensitive areas, at least 70 percent of the forest should be retained in a relatively uniform distribution. In the base case, these areas were categorized as uneven-aged management areas.

Based on operational experience, in the base case the licensee assumed that retention levels would be partially met through areas excluded for operational reasons from the timber harvesting land base after the watershed plan reserves were excluded. Full contribution for retention requirements were assumed to come from areas deducted for environmentally sensitive areas, recreation features, and problem forest types. Approximately 20 percent of the areas deducted for non-commercial, low site, and uneconomic types were also assumed to contribute to retention requirements.

For areas classified as Terrain class IV the licensee applied a 50-percent retention level, instead of the 70-percent retention level, assuming the remainder would come from areas deducted from the timber harvesting land base after the deduction for watershed plan reserves. As a result, 4445 hectares were retained.

For natural appearing and minimal alteration scenic areas, the licensee assumed that the forest cover requirements as described below under *visual landscape management* would account for the 70-percent retention level. In addition for these areas, in order to maintain structural diversity, the licensee adopted the following approach. Due to operational constraints the licensee assumed it would leave 20 percent rather than the Scientific Panel's recommended 15-percent minimum retention level. It then assumed that 20 percent of the retained areas would be located in areas excluded from the timber

harvesting land base after the deduction made for watershed plan reserves. Therefore, the retention level applied in the base case was 16 percent.

For the remaining areas — small scale alteration scenic areas and even-aged management — the licensee assumed a 15-percent retention level; however, as above, 20 percent of this retention level would be located in areas excluded from the timber harvesting land base after the deduction made for watershed plan reserves. Therefore, the retention level applied in the base case was 12-percent. District staff found this approach reasonable, as do I.

In the base case, the total area deducted for wildlife tree retention in the derivation of the timber harvesting land base was 8206 hectares.

In the base case, the Terrain Class IV remaining on the timber harvesting land base was not modelled as a separate zone. As a result, where Terrain Class IV areas overlapped with scenic areas, the constraints for scenic areas were in effect. On average for these areas, the number of entries for the three categories of visual management amounted to 3.4 entries per rotation, as described below in *visual landscape management*. However, in practice, in Terrain Class IV there will be only one harvest entry in every rotation. Therefore, with 62 percent of Terrain Class IV in visual zones, the contribution that Terrain Class IV makes to the area available for harvest each year has been overestimated in the base case.

In the base case the remaining 38 percent of the Terrain Class IV area on the timber harvesting land base overlapped with the even-aged management area. This area was modelled with only one harvest entry per rotation, this being the appropriate constraint for Terrain Class IV areas.

BCFS staff presented me with a modified base case showing the separate contribution to the annual harvest of Class IV terrain of 26.8 hectares and the consequently adjusted uneven-aged management, and even-aged management categories, 223.9 hectares and 88.3 hectares, respectively.

I was then presented a second modification to the base case related to the treatment of wildlife tree retention. In the base case, the licensee deducted 8206 hectares to account for wildlife tree retention. As discussed above, in Clayoquot Sound the use of the variable retention silvicultural system accounts for wildlife tree retention and other non-forest values. As discussed above in *uneven-aged stands*, the entire area affected by harvesting is considered to be the cutblock. In effect, therefore, I believe it was not necessary to remove the 8206 hectares from the timber harvesting land base to account for wildlife tree retention in the base case. As a result, the timber harvesting land base was underestimated in the base case by 8206 hectares across the Terrain Class IV, uneven-aged and even-aged management areas.

As a result of the second modification to the base case, the annual harvest levels were further adjusted as follows. The contribution of harvest was increased to 53.5 hectares from Terrain Class IV, 257.5 hectares from the uneven-aged management category and 98.9 hectares from the even-aged management category.

I have reviewed the adjustments with BCFS staff and am satisfied that the methods used for revising the base case were appropriate, and I will factor this into my determination as discussed under "Reasons for Decision".

- *visual landscape management*

Careful management of scenic areas along travel corridors and near recreational sites is an important integrated resource management objective, and is part of the BCFS mandate to manage the recreation resource. The 1993 CSLUD designated approximately 15 percent of Clayoquot Sound as special management for scenic corridors where protection and management of scenic landscapes was to take priority over other resource activities. In accordance with the land-use decision, a scenic corridors planning process was initiated to develop a landscape plan for the scenic corridor areas. It was jointly administered by the Ministry of Forests and former Ministry of Small Business, Tourism and Culture, and incorporated local knowledge and advice from an advisory group and interagency planning team.

The recommendations contained in the Scientific Panel reports regarding scenery, and the methodology detailed by the Scenic Corridors Landscape Management Plan are being incorporated in watershed level planning for all visually sensitive areas of Clayoquot Sound. This includes areas visible from highways, major waterways and other travel corridors.

In 1998, the district manager of South Island Forest District designated the Clayoquot Sound visual corridors as known scenic areas. Three visual management zones (small scale alteration, minimal alteration, and natural appearing) based on the Clayoquot Sound Scenic Resource Inventory are located within the scenic areas. Current harvesting practice is a mixture of dispersed retention (single tree removal, narrow strips, and small groups) and aggregated retention (small patches).

For the visual management zones, the licensee adopted allowable denudation limits specified in the Ministry's *Visual Impact Assessment Guidebook* that would provide a 90 percent probability that a particular visual quality designation would be met. This in turn critically formed the basis for assumptions of the number of entries over the period of a full rotation.

For the "natural appearing visual zone", the licensee expects to remove no more than 25 percent of the forest cover upon each entry. On that basis, the licensee assumed four entries per rotation for that portion of the timber harvesting land base. For the "minimal alteration visual zone" and the "small scale alteration visual zone", the licensee expects to remove no more than 30 percent and 35 percent of the forest cover respectively. On that basis, the licensee assumed three entries per rotation for those portions of the timber harvesting land base. The area-weighted average across the three visual zone categories is 3.4 entries per rotation.

The return interval for each of the visual zones described above is a function of the expected time for the disturbed portion of the treatment area to achieve the desired

green-up height — 24 years to attain 6 metres for "small scale alteration", 27 years to attain 7 metres for "minimal alteration", and 30 years for trees to attain 8 metres in height for "naturally appearing".

I note that the forest cover requirements applied along with the retention levels described under *stand-level retention* should meet the minimum 70-percent retention level recommended by the Scientific Panel for cutting units with significant values for resources other than timber. I have reviewed the available information concerning visual landscape management in TFL 57 with BCFS staff. I am satisfied that the assumptions in the base case reflect the practices in Clayoquot Sound and have made no adjustments on this account for this determination.

- *wildlife*

The Clayoquot Sound area supports a vast number of wildlife species, including black bear, deer, elk, cougar, and numerous sea animals and birds which depend on the area for habitat. According to the licensee, on TFL 57 wildlife habitat for these species is generally expected to be managed through the reserve network, rate-of-cut provisions and the variable retention silvicultural system.

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. The licensee's Management Plan No. 1 includes a Conservation Data Centre listing of 17 wildlife species.

Elsewhere in the province, identified wildlife species will be managed through the establishment of wildlife habitat areas (WHAs) and implementation of general wildlife measures. For the Clayoquot Sound area, the watershed-level planning process – through the establishment of specific reserve areas in accordance with the recommendations of the Scientific Panel – will incorporate the needs of the province's Identified Wildlife Management Strategy and Ungulate Winter Range. BCFS and MWLAP staff concur that completed watershed plans are expected to meet those needs.

Subsequent to developing the assumptions that were applied in the base case, Marbled Murrelet (MAMU) reserves were mapped for the TFL and included in the three now completed watershed plans (Bedingfield, Cypre, and Flores) and in the substantially completed watershed plan for Tofino/Tranquil. Specific reserves for Marbled Murrelet were identified by MWLAP staff as a priority because, in respect of the 17 wildlife species listed for the area in the Conservation Data Centre, planning for the protection of Marbled Murrelet was needed at the landscape level.

BCFS staff inform me the Marbled Murrelet reserves, spread proportionately across the timber harvesting land base, amount to 1255 hectares. This is equivalent to 4.7 percent of the total timber harvesting land base.

MSRM staff inform me that additional Marbled Murrelet reserves have been drafted in the remaining watersheds and they expect the final reserves will cover a lower proportion of the total land base in those watersheds than the reserves in the four completed and substantially completed watershed plans.

I note that without information on the distribution of the anticipated new reserves, it is difficult to predict what their impact will be on timber supply. It is very likely, however, that the percent reduction of the timber harvesting land base will be greater than the 4.7 percent reduction resulting from the four watershed plans. At this time I have no analysis to show the exact implications for timber supply pertaining to the total area of Marbled Murrelet habitat that will eventually be reserved on TFL 57. I nevertheless consider the timber harvesting land base in the base case to be overestimated by more than 4.7 percent. I will take this into account under "Reasons for Decision".

- *cultural heritage*

Cultural heritage resources include archaeological and traditional use sites. In general, cultural heritage sites occur primarily along marine shorelines, although culturally modified trees (CMTs) can occur in other locations.

In Clayoquot Sound, a recent archaeological inventory concluded that the majority of sites of archaeological or traditional use are in close proximity to marine shorelines. No specific reductions were applied to the timber harvesting land base during the analysis to account for cultural heritage resources. It was assumed that most of these features will be protected within reserves (primarily marine shore reserves) or visual management zones where retention levels are high.

In accordance with the recommendations of the Scientific Panel for protecting cultural values, the Ahousaht Culturally Significant Areas Mapping Project produced several outcomes in three watershed planning units (Bedingfield, Cypre, and Flores):

- identification and mapping of areas of significance to Ahousaht in the context of cultural use;
- a generalized map of areas of cultural significance to Ahousaht;
- a consultation process for development proposals;
- further recognition of two important Ahousaht concepts – ***hishuk ish ts'awalk*** *("*everything is one*")* and ***Hahuulhi*** (Nuu-cha-nulth system for hereditary ownership and control of traditional territories).

Through the mapping project, in the three completed watershed plans, the Ahousaht First Nation has identified approximately 6925 hectares or 45 percent of Flores Island as culturally significant areas; 4675 hectares or 67.5 percent of these areas are located within the reserve network. The Bedingfield planning unit has approximately 7199 hectares or 67.9 percent identified as culturally significant areas; 3713 hectares or 51.6 percent of these areas are located within the reserve network. The Cypre planning unit has approximately 7222 hectares or 29.2 percent identified as culturally significant areas;

3119 hectares or 44.2 percent of these areas are located within the reserve network. Protection of culturally significant areas within the harvestable area will come through the consultation process developed by the Ahousaht Culturally Significant Areas Mapping Project.

MSRM staff inform me that upon completion, the remaining watershed plans for the TFL will include broadly delineated areas of cultural significance identified by the Tla-o-qui-aht and Hesquiaht First Nations. When the remaining plans are completed, it is expected that cultural values in the entire TFL will be protected either through the reserve network or through consultation processes developed by First Nations.

I have reviewed this information and consider it likely that some area will be retained within the timber harvesting land base for culturally significant features. I also note that these features could be protected through areas retained under the variable retention silvicultural system. At this time I cannot predict how much, if at all, timber harvesting land base will be reduced for the protection of these features, and therefore, I make no adjustment on this account in this determination. Any cultural values identified in the timber harvesting land base through the planning process will be accounted for in future determinations.

(e) any other information that, in the chief forester's opinion, relates to

(i) the capability of the trial management unit to produce timber, or

(ii) the suitability of areas within the trial management unit for timber harvesting.

First Nations considerations

The TFL is located within the traditional territory of the Nuu-chah-nulth Central Region First Nations (Ahousaht, Hesquiaht First Nation, Tla-o-qui-aht First Nation, Toquaht Nation, and Ucluelet First Nation). The Ahousaht, Hesquiaht First Nation, and Tla-o-qui-aht First Nation have areas of interest within TFL 57.

In October 2001, the licensee presented the draft Management Plan No. 1 to the Central Region Chiefs. The Tla-o-qui-aht First Nation asked how First Nations' interests, including the need for quality timber to sustain cultural values, have been addressed in the timber supply analysis. Additional comment was made by the First Nation that it might not be possible to harvest the entire AAC due to unidentified cultural values.

Although no specific reductions for cultural heritage resources were made in the analysis, a percentage of the culturally significant areas in the three now completed watershed plans are protected within the reserve network. Outside of the reserve network in the Ahousaht traditional territory, the Ahousaht consultation process will apply. Regarding the supply of quality timber to sustain cultural values, I note that the reserve network does not exclude the use of timber for cultural use; and the variable retention silvicultural system will ensure that culturally significant trees, such as large cedars, may be retained.

At the operational planning level the licensee conducts surveys to identify any cultural heritage resources prior to the cutting permit stage.

In July 2004, South Island Forest District staff sent copies of proposed Management Plan No. 1, the Information Package and Timber Supply Analysis to the above-listed five First Nations and the Central Region Board. The licensee and BCFS staff then met with the Central Region Board to discuss this information. Following a review period, the Central Region Board recommended approval of the Management Plan.

I am aware that the licensee indicates in Management Plan No. 1 that it operates in accordance with the *Interim Measures Agreement* and subsequent extension agreements between the provincial government and hereditary chiefs of the Nuu-chah-nulth Central Region Tribes. The licensee also indicates that it has developed a good working relationship with the Central Region Board through review of its operational and strategic plans, including making additional presentations to the Central Region Board with respect to planning initiatives.

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.

I have reviewed the above information and in making this determination, I am mindful of the expressed First Nations' interests.

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 meant to be strategic and is therefore, not as precise or accurate as an operational plan. No harvesting authority is granted on the basis of a twenty-year plan.

For TFL 57 the licensee provided the twenty-year plan in a different format than is usual for other Tree Farm Licences. It consisted of a map which delineated the timber harvesting land base and the watershed boundaries, and a table listing the proposed harvest areas, volumes, and approximate retention levels by watershed unit for each of the four, five-year periods of the plan. The licensee used this approach, indicating that without completed watershed plans with reserve networks identified, it could not locate cutblocks on a map.

The licensee submitted its twenty-year plan on November 27, 2003, and it was accepted by the district manager on June 10, 2004. According to the plan, the harvesting level projected in the base case could be achieved for at least twenty years.

Harvest scheduling

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

Difference between AAC and actual harvest

Until the *Forest Act* was amended in 2003, 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 limited only to harvesting no more than 110 percent of their AAC over a five-year period.

The first five-year cut control period for TFL 57 began on January 1, 2000 with an AAC available to the holder of 110 390 cubic metres per year. To 2003, the licensee harvested 15.5 percent of the total volume available to it since the beginning of the cut control period.

I have reviewed the information with district staff regarding the difference between the AAC and the actual rates of harvest, and I conclude that the differences are attributable primarily to reasons other than shortages of suitable timber volumes in the TFL.

Planning issues

In Management Plan No.1 the licensee highlighted a number of initiatives that raise awareness of the activities on the TFL and in Clayoquot Sound.

- *UNESCO biosphere reserve*

In January 2000, Clayoquot Sound received the designation of Biosphere Reserve under the 'Man and the Biosphere' program of the United Nations Education Science and Cultural Organization (UNESCO). Biosphere reserves are areas of terrestrial and coastal ecosystems where solutions are promoted to reconcile the conservation of biodiversity with its sustainable use. It is widely considered that many of the land-use and management components already established for Clayoquot Sound satisfy the requirements of an IBR designation. No special management practices relative to the Biosphere have been instituted on TFL 57. Future analyses and AAC determinations will account for any possible changes in management arising from the Biosphere Reserve designation.

- *forest management certification*

In June 2001, Iisaak achieved Forest Stewardship Council (FSC) certification for TFL 57, which certifies its products are from sustainably managed forests. In addition, according

to Management Plan No. 1 the licensee intends to further develop its environmental management system and pursue ISO 14001 registration.

No special considerations relative to forest management certification have been instituted on TFL 57. Future analyses and AAC determinations will consider any possible changes in management arising from third party certification regimes.

- *eehmiis areas*

At the beginning of the management planning process, the licensee identified two land base categories for TFL 57 – draft eehmiis ("areas that are very precious") and active forest management areas. The draft eehmiis areas are within the Integrated Resource Management Area or Special Resource Management Area defined in the Clayoquot Sound Land Use Decision. They are generally areas with no harvest history where completed watershed plans are required before any forest development is permitted. The licensee defined the eehmiis areas after taking into consideration discussions with First Nations, the Memorandum of Understanding with environmental groups, and the 1998 Chapman report on undeveloped watersheds. On TFL 57 eehmiis areas occur in six watershed units and contain over 10 000 hectares of timber harvesting land base.

According to Management Plan No. 1, the licensee intends to further refine management intention for these areas over the term of the plan. It anticipates the watershed plans will be completed within that time, and they will provide general direction for forest management in the eehmiis areas. In the meantime the licensee intends to harvest in developed watersheds and the twenty-year plan reflects this.

I note there is no indication in Management Plan No. 1 or the completed watershed plans that harvesting will not eventually occur, or that forest management will be different in the eehmiis areas. For this determination I therefore consider these areas will contribute to timber supply in the mid- to long term and make no adjustment on this account. If management practices are developed for the eehmiis areas that differ from those used elsewhere in Clayoquot Sound, they can be considered in a future determination.

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

Alternative rates of harvest

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 analysis for TFL 57 the licensee did not provide any harvest projections other than to the flat-line base case, noting that the base case provided the highest possible projection of timber supply. Nevertheless, based on the model output data, I am aware that in the base case, timber supply is most limited in decades eleven and twelve. This coincides with the transition from harvesting currently existing natural stands to

harvesting managed stands. In the base case, old forest (older than age 200 years) forms a large component of the harvest until 60 years from now.

Based on the information provided, I am satisfied that, subject to the assumptions underlying the forecast and the considerations discussed in this document, the base case projection is robust for the first 60 to 100 years of the forecast. Furthermore, based on the model output data, following this period the harvest level could be increased relative to the level projected in the base case. In making this determination I have been mindful of the stability of the base case in the short- to medium-term.

(c) Repealed

(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 4) and a memorandum dated February 26, 1996, (attached as Appendix 5). The Minister has also expressed the social and economic objectives of the Crown specifically for the Clayoquot Sound area in a letter to the chief forester, dated September 17, 1996 (attached as Appendix 6).

In my consideration for this AAC determination for TFL 57, I have been mindful of the information in each of these documents. However, in view of the more specific nature of the objectives for Clayoquot Sound as expressed in the Minister's most recent letter, I have placed more weight on these specific objectives than on the more general expressions for the province in the other two documents.

In particular, in his memo regarding Clayoquot Sound, the Minister stated that government recognizes the complex and unique circumstances and history surrounding the development of forest management policy for the Clayoquot Sound, and has accepted the recommendations of the Scientific Panel. The Minister confirmed government's intentions that timber harvesting continue to be one of the forest management objectives for the Clayoquot area and that management of the area be carried out in accordance with both the Forest Practices Code and the recommendations of the Scientific Panel. The Minister specifically expressed the Crown's intention that these objectives should be taken into consideration in AAC determinations for areas which include portions of Clayoquot Sound.

The objectives of the Crown expressed for the province in the other two documents refer to forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest level changes in a managed transition from old-growth to second-growth

forests so as to provide for continuity of employment. They also include the statement that "any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability". The Minister also placed particular emphasis on the importance of long-term community stability and the continued availability of 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. The latter would likely require the use of alternative harvesting systems, and to encourage this the Minister suggested consideration of partitioned AACs.

Although commercial thinning may have future applications in the young, even-aged, second-growth forests in Clayoquot Sound, in the short- and medium-terms, timber supply contributions are assumed from old-growth forests only. I am aware that the licensee's Management Plan No. 1 suggests it will investigate commercial thinning opportunities in second-growth forests over the next ten years. I do not anticipate any significant operations of this nature in the immediate future, given that almost all of the second-growth timber is less than 40 years of age. As a result, I conclude that I need not make any explicit provision for commercial thinning in the context of this determination.

- *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 stakeholder and public review of the draft management plan, 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 September 4, 5, 6 and 10, 2001 in Ucluelet, Tofino, Ahousaht, and Opitsat, respectively, and making the documents available for public viewing.

I note that in the Central Region Board's recommendation for approval of Management Plan No. 1 the Board indicates it is hopeful that Iisaak will strive to maintain some level of consistent harvest, since a continuous and reliable supply of wood is a necessary prerequisite to establish and attract investment in the local communities and in value-added businesses.

The licensee indicates in its management plan that the total number of people employed by the company and associated with TFL 57 fluctuates with harvest levels. The licensee indicated there are full-time equivalent estimates for three categories (primary harvest, salvage, and manufacturing) at different volume levels of harvest – employment ranges from 29 to 109 for 10 000 cubic metres per year to 100 000 cubic metres per year, respectively.

Regarding the Central Region Board's expressed hope that the licensee maintain a consistent level of harvest, I note the AAC I determine should be sustainable, given the forest management regime I understand is being implemented in Clayoquot Sound.

I am satisfied that the licensee has carried out its public involvement obligations satisfactorily, and I am aware that 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.

Non-recoverable losses

Non-recoverable losses are timber volumes destroyed or damaged by causes such as fire, wind or disease, which are not recovered through salvage operations. In Clayoquot Sound, non-recoverable losses are assumed to be a natural and desirable feature of the old-growth forests dominating the area. Silvicultural systems are to be implemented in a way that best mimics the natural disturbance patterns of the area.

In coastal forests, such as those on TFL 57, losses that could significantly alter the age-class distribution, and therefore affect timber supply, occur rarely. Endemic losses due to insects, disease and windthrow reduce the volume recovered from a harvested area, but are not a consideration in an area-based AAC determination, as the entire area affected by harvesting is considered to be the cutblock.

Having reviewed the information regarding unsalvaged losses on TFL 57, I am satisfied that the assumptions used in the base case were appropriate for this determination.

Salvage Program

According to Management Plan No. 1, the licensee has an active timber salvage program focused on salvage associated with road deactivation (danger tree removal, bridge stringers and log culverts) with some areas of windthrow also being salvaged. The licensee also plans to recover 10 000 cubic metres to 15 000 cubic metres per year of cedar shakes over the next 10 years. It commits to conducting the salvage in accordance with the Scientific Panel recommendations to not remove blow down in retention units except where it threatens desired values.

I note that in an area-based AAC determination the salvage volume is not relevant to the determination, as the entire area affected by harvesting is considered to be the cutblock.

Reasons for decision

In reaching my AAC determination for TFL 57, I have considered all of the factors presented above and have reasoned as follows.

Based on my review of the licensee's base case described above, 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 375 hectares per year could be maintained on TFL 57.

In determining this AAC, I have identified one factor that indicates the base case over-estimated timber supply, and one that indicates it underestimated timber supply. These factors can be quantified and their impacts assessed with some reliability. I have also identified a third factor that indicates timber supply has been overestimated in the base case; however its precise impact cannot be reliably quantified at this time. I have accounted for this factor in more general terms.

The following factor lead me to conclude that the base case overestimated the area-based timber supply:

- *Terrain Class IV* – in the base case 62 percent of the Class IV terrain was modelled using uneven-aged management assumptions with an area-weighted average of 3.4 entries per rotation across the three visual zones. In practice, the areas in Class IV terrain will have a single entry per rotation period of about 100 years.

  The remaining 38 percent of the Class IV terrain was modelled using even-aged management assumptions with harvesting occurring once in each rotation period, approximately 100 years. In considering the contribution of Terrain Class IV in isolation from the even- and uneven-aged management categories, I determined that it contributes 26.8 hectares to the harvest level.

  Consequently, I adjusted the base case projections of 100 hectares per year for even-aged management, and 275 hectares per year for uneven-aged management downward to 88.3 and 223.9 hectares per year, respectively. Based only on this adjustment the revised total harvest level, including the contribution from Terrain Class IV, would be 339 hectares per year.

The following factor lead me to conclude that base case underestimated timber supply:

Stand-level retention – I concluded that the 8206-hectare deduction for wildlife tree retention in the base case was unnecessary because retention levels for structural diversity are accounted for through the use of the variable retention silvicultural system and the entire area affected by harvesting is considered to be the cutblock for cut control purposes. Consequently, I further adjusted the annual harvest level projected in the base case to 53.5 hectares for Terrain Class IV, 98.9 hectares for even-aged management, and 257.5 hectares for uneven-aged management. The revised total timber supply would be 409.9 hectares per year.

The following factor lead me to conclude that the base case overestimated timber supply, but the precise reduction cannot be reliably quantified at this time:

Marbled Murrelet reserves – the Marbled Murrelet reserves identified in the four completed and substantially completed watershed plans amount to 1255 hectares or 4.7 percent of the TFL 57 timber harvesting land base, distributed proportionately across the Terrain Class IV, even-aged and uneven-aged management areas.

> In the absence of analysis to specifically quantify the effect of removing the Marbled Murrelet reserves from the timber harvesting land base, for this determination, I will assume the reduction in timber supply is proportional to the reduction in the timber harvesting land base, that is 4.7 percent. In addition, I will assume that Marbled Murrelet reserves in the yet-to-be-completed watershed plans will further reduce timber supply by 2.3 percent, based on a premise that the additional reserves will be half as significant proportionally as are the completed reserves. I acknowledge that the final impact on timber supply may be higher or lower than 2.3 percent, and I expect this assumption to be superceded by actual data when the AAC is next determined.
>
> As a result, I will adjust the estimated timber supply by a total of 7 percent to reflect Marbled Murrelet reserves, bringing it to 381.2 hectares, with contributions of 49.8 hectares from Terrain Class IV, 92.0 hectares from even-aged management areas, and 239.4 hectares from uneven-aged management areas.

I believe the base case rate of harvest, adjusted as described in these *Reasons*, is well below the upper limits of watershed-level rates of cut specified by the Clayoquot Sound Scientific Panel. The base case rate of harvest is also well within limits inherent in the Panel's recommendations for continuous retention of forest cover older than 140 years of age.

Determination

This is the first AAC in the province to be denominated in hectares, rather than cubic metres to be harvested each year. A number of factors that are critical to a volume-denominated AAC determination (e.g., inventory volume) are not germane in this case. My *Reasons* therefore are essentially limited to factors that have a bearing on the area available for harvest each year.

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 381 hectares.

Given the sensitivity of this area-based AAC to the proportions of even-aged and uneven-aged management, I attribute 92 hectares of the AAC to even-aged harvesting operations, and the remaining 289 hectares to uneven-aged harvesting operations, which includes the Terrain Class IV area.

This AAC should not be construed as an input to local planning processes overseen by the Central Region Board, which are intended to identify the specific areas for harvest on which the actual harvest level achieved will depend.

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:

- collect local field data on the width of roads constructed on the TFL;
- monitor the impact that variable retention is having on timber availability, including the productivity of regenerating stands;
- consider doing Site Index/BEC (SIBEC) work or ground sampling to improve the estimates of productivity because of its impact on minimum harvestable age; and
- conduct an operability review to refine the definition of marginally economic timber.

During the term of Management Plan No.1, the licensee should continue to work closely with South Island Forest District staff and with the CRB to ensure that all timber harvesting in the Clayoquot Sound area is a result of, and conforms to, appropriate local planning and forest practices as recommended by the Scientific Panel.

Ken Baker
Deputy Chief Forester

November 8, 2004

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157
Consolidated to October 21, 2004, 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 (2) or (3),

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 an allowable annual cut 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) Repealed [2003-31-02]

(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.

Appendix 2: Section 4 of the *Tree Farm Licence area-based Allowable Annual Cut Trial Program Regulation*

Section 4 of the *Tree Farm Licence area-based Allowable Annual Cut Trial Program Regulation* (deposited 2004) reads as follows:

Section 8 of the Act is varied

4 (1) When determining the allowable annual cut for a trial management unit, the chief forester, in addition to the matters set out in section 8 (8) (b) to (e) of the Act, must consider the rate of harvesting, based on the amount of land from which timber is to be harvested annually, that may be sustained within the trial management unit, taking into account the following factors, which replace the factors set out in section 8 (8) (a) (i) to (vi) of the Act:

(a) the composition of the forest within the trial management unit and its expected rate of growth;

(b) the expected time that it will take the forest within the trial management unit, excluding areas that no longer contribute to the productive forest land base, such as areas on which permanent access structures have been constructed, to become re-established after timber is cut, damaged or destroyed;

(c) the silvicultural systems and silviculture treatments to be applied within the trial management unit;

(d) the constraints on the amount of land available for timber harvesting that reasonably can be expected from use of the trial management unit for purposes other than timber production;

(e) any other information that, in the chief forester's opinion, relates to

(i) the capability of the trial management unit to produce timber, or

(ii) the suitability of areas within the trial management unit for timber harvesting.

(2) Despite subsection (1), if the rate of harvesting referred to in that subsection is based in part on the volume of timber that is to be harvested annually, the chief forester must take into account the factors set out in section 8 (8) (a) (i) to (vi) of the Act, to the extent the chief forester determines they affect the volume of timber that may be harvested annually from the trial management unit.

(3) In determining an allowable annual cut under subsection (1) the chief forester,

(a) in the case of an allowable annual cut, or part of an allowable annual cut, that is based on the amount of land from which timber is to be harvested, may specify a different amount of land for different parts of the trial management unit, for different silvicultural systems, or for different types of timber or terrain, and

(b) in the case of an allowable annual cut, or part of an allowable annual cut, that is based on the volume of timber that is to be harvested, may specify a different volume for different parts of the trial management unit, or for different types of timber or terrain,

and section 8 (5) of the Act is varied accordingly.

Appendix 3: 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 4: Minister of Forests' letter of July 28, 1994

Appendix 5: Minister of Forests' memo of February 26, 1996

Appendix 6: Minister of Forests' letter of September 17, 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

File: 10100-01

September 17, 1996

Larry Pedersen
Chief Forester
Ministry of Forests
595 Pandora Avenue
Victoria, British Columbia
V8W 3E7

Dear Larry Pedersen:

Re: Social and economic objectives of the Crown in the Clayoquot Sound area

The government of British Columbia recognizes that the circumstances and history surrounding the development of forest management policy for the Clayoquot Sound area are complex and unique in British Columbia. In particular, government has accepted the recommendations of the report of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound.

Since these circumstances are specific to the Clayoquot Sound area, it is appropriate to express social and economic objectives of the Crown for this area specifically, in addition to the more generally applicable objectives expressed in the letter dated July 28, 1994, and the memo dated February 26, 1996, from the Minister of Forests to the Chief Forester.

In that respect, first, I confirm that it is government's intention that timber harvesting continue to be one of the forest management objectives for the Clayoquot area. Second, it is government's intention that management of the area be carried out in accordance with both the Forest Practices Code and the recommendations of the Scientific Panel for Sustainable Forest Practices in Clayoquot Sound.

These intentions should be read as an expression of the socio-economic objectives of the Crown for the Clayoquot Sound area, for consideration in the determination of allowable annual cuts for those management units which include parts of Clayoquot Sound.

Yours truly,

David Zirnhelt
Minister of Forests