

**BRITISH COLUMBIA
MINISTRY OF FORESTS**

Tree Farm Licence 38

Issued to International Forest Products Limited

Rationale for Allowable Annual Cut (AAC) Determination

effective August 6, 1998

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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 as chief forester of British Columbia in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 38. This document also identifies where new or better information is required for incorporation into future determinations.

Description of the TFL

TFL 38 is held by International Forest Products Limited and is administered by the Squamish Forest District, which is part of the Vancouver Forest Region. The TFL is located on the mainland coast, commencing approximately 25 kilometres north of Squamish, and is adjacent to the Soo Timber Supply Area (TSA). TFL 38 is adjacent to the towns of Squamish and Whistler, and the villages of Lions Bay and Pemberton, all of which are located within the Squamish-Lillooet Regional District (SLRD). In total, about 27 000 people live in the SLRD. Squamish is the largest community in the SLRD, with a population of approximately 15 100.

The total area of TFL 38 is 218 616 hectares, 72 percent of which are non-forested, steep, mountainous terrain and ice-fields. Approximately 60 723 hectares, 28 percent of the TFL area, are considered productive forest land, and the current timber harvesting land base is estimated at 36 609 hectares. Approximately 68 percent of the operable forest area is mature forest dominated by western hemlock, balsam and western redcedar. TFL 38 lies within three biogeoclimatic zones: Coastal Western Hemlock, Mountain Hemlock, and Alpine Tundra.

TFL 38 includes the watersheds of the Ashlu and Elaho Rivers, and the balance of the Squamish River system. The Elaho River is fed by two large secondary drainages, Sims Creek and Clendenning Creek.

The traditional territories of several First Nation bands overlap the Squamish Forest District: the Anderson Lake Band, the Douglas Band, the Samahquam Band, the Skookumchuck Band, the Burrard Band, the Mount Currie Band, and the Squamish First Nation. Indian and Northern Affairs Canada estimated the total membership of these bands in 1992 at approximately 5300 members. The first four of these bands are collectively known in treaty as In-Shuck-ch/N'quatquo. The Squamish and Mount Currie traditional territories—with 1992 populations of 2549 and 1461 respectively—overlap TFL 38.

History of the AAC

Harvesting and forest management activities have occurred in the area now covered by TFL 38 since the mid 1950s. TFL 38 was first issued to Empire Mills Limited in 1961. In 1981, Empire Mills Limited was amalgamated with a number of other companies (Wellington Colliery Company Limited, Timberland Development Company Limited and Canim Lake Sawmills Limited) under the name Canim Lake Sawmills Limited. In 1982 Canim Lake Sawmills Limited was acquired by, and became part of, Weldwood of Canada Limited. At that time, a new 25-year agreement (TFL 38) was issued to Weldwood of Canada Limited. On February 27, 1995, TFL 38 was transferred to International Forest Products Limited.

The AAC set for Management Plan (MP) No. 1 for TFL 38 in 1961 was 117 516 cubic metres. In 1964 the AAC was increased to 152 912 cubic metres. This was increased again in 1969 to 263 348 cubic metres, and again in 1978 to 263 380 cubic metres. In 1986 the AAC for TFL 38 was decreased to 263 000 cubic metres. In 1992 the AAC was again determined at 263 000 cubic metres. In March, 1998, through Instrument #10, an amendment to the TFL, an area within the proposed Clendenning Park was removed from the TFL, and the Minister of Forests then reduced the Small Business Forest Enterprise Program portion of the AAC by approximately five per cent, from 25 581 cubic metres to 13 118 cubic metres. However, the total AAC for the TFL was not reduced and has remained at 263 000 cubic metres until the present determination.

New AAC determination

Effective August 6, 1998, the new AAC for TFL 38, including Schedule A private land, and all Schedule B land including the Small Business Forest Enterprise Program, will be 250 500 cubic metres, a decrease of 4.8 percent from the current AAC of 263 000 cubic metres.

This AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination.

Information sources used in the AAC determination

Information considered in determining the AAC for TFL 38 includes the following:

- TFL 38 Management Plan No. 8 for the Period January 1, 1998 to December 31, 2002, International Forest Products Limited (proposed plan dated October 1997, approved January 6, 1998);
- Statement of Management Objectives Options and Procedures (SMOOP) for Management Plan No. 8, TFL No. 38, accepted by the British Columbia Forest Service (BCFS) August 20, 1996);
- Timber Supply Analysis Report for Tree Farm Licence 38, dated November 1997, prepared for International Forest Products Limited by Timberline Forest Inventory Consultants Limited;

- Letter from the Squamish Forest District Manager to International Forest Products Limited, dated December 16, 1997, accepting the licensee's 20-year plan for TFL 38;
- Public input solicited by the licensee regarding the contents of Management Plan No. 8;
- Letter from the chief forester to International Forest Products Limited, dated December 23, 1996, establishing the schedule for approval of Management Plan No. 8 and for the determination of the allowable annual cut for TFL38;
- Letter from the Minister of Forests to the chief forester, dated July 28, 1994, stating the Crown's economic and social objectives for the province;
- Memorandum from the Minister of Forests to the chief forester, dated February 26, 1996, stating the Crown's economic and social objectives for the province regarding visual resources;
- Letter from the Deputy Ministers of Forests and Environment, Lands and Parks, dated August 25, 1997, conveying government's objectives regarding the achievement of acceptable impacts on timber supply from biodiversity management ;
- Letter from the Vancouver Forest Regional Manager to licensees, dated May 22, 1996, providing direction on landscape-level biodiversity strategies;
- Memo from the Vancouver Forest Regional Manager, to district managers and regional team leaders, dated December 15, 1997, regarding wildlife tree patch implementation;
- Memo and attachment from the Director, Timber Supply Branch, re Incorporating Biodiversity and Landscape Units in the Timber Supply Review, December 1, 1997;
- Technical information provided through correspondence and communication between staff of the BCFS and the Ministry of Environment, Lands and Parks (MELP);
- Technical review and evaluation of current operating conditions through comprehensive discussions with staff of the BCFS and MELP, including the AAC determination meeting held in Victoria on November 27, 1997;
- *Forest Practices Code of British Columbia Act*, July 1995;
- *Forest Practices Code of British Columbia Act Regulations*, April 1995;
- *Forest Practices Code of British Columbia Guidebooks*, BCFS and MELP;
- *Forest Practices Code Timber Supply Analysis*, February, 1996, BCFS and MELP; and
- *Schedule of Indian Bands, Reserves and Settlements*, Indian and Northern Affairs Canada, December 1992.

Role and limitations of the technical information used

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

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

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

In making the AAC determination for TFL 38, I have considered known limitations of the technical information provided, and I am satisfied that the information provides a suitable basis for my determination.

Statutory framework

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining AACs for timber supply areas and tree farm licences. Section 8 is reproduced in full as Appendix 1.

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. In making a large number of determinations 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 my approach in these matters explicit, I have set out the following body of guiding principles. If in some specific circumstance it may be necessary to deviate from these principles, I will provide a detailed reasoning in the considerations that follow.

Two important ways of dealing with uncertainty are:

- (i) minimizing risk, in respect of which in making AAC determinations, I consider the uncertainty associated with the information before me, and attempt to assess the various potential current and future social, economic and environmental risks associated with a range of possible AACs; and
- (ii) redetermining AACs frequently, to ensure they incorporate current information and knowledge—a principle that has been recognized in the legislated requirement to

redetermine AACs every five years. The adoption of this principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires me 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 from current practices. It is not appropriate to base my decision on unsupported speculation with respect either to factors that could work to *increase* the timber supply—such as optimistic assumptions about harvesting in unconventional areas, or using unconventional technology, that are not substantiated by demonstrated performance—or to factors that could work to *reduce* the timber supply, such as integrated resource management objectives beyond those articulated in current planning guidelines or the Forest Practices Code (the Code).

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

Although the Code is now fully implemented following the end of the transition period on June 15, 1997, the timber supply implications of some of its provisions, such as those for landscape-level biodiversity, still remain uncertain, particularly when considered in combination with other factors. In each AAC determination I take this uncertainty into account to the extent possible in context of the best available information.

As BC progresses toward the completion of strategic land use plans, the eventual timber supply impacts associated with land-use decisions resulting from the various planning processes—including the Commission on Resources and Environment (CORE) process for sub-regional plans, the Protected Areas Strategy, and Land and Resource Management Planning (LRMP) process—are often discussed in relation to current AAC determinations. Since the outcomes of these planning processes are subject to significant uncertainty before formal approval by government, it has been and continues to be my position that in determining AACs it would be inappropriate to attempt to speculate on the timber supply impacts that will eventually result from land-use decisions not yet taken by government. Thus I do not account for possible impacts of existing or anticipated recommendations made by such planning processes, nor do I attempt to anticipate any action the government could take in response to such recommendations.

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

ensure that future determinations address ongoing plan implementation decisions. However, where specific protected areas have been designated by legislation or by order in council, these areas are immediately deducted from the timber harvesting land base and are no longer considered to contribute to the timber supply in AAC determinations.

Forest Renewal British Columbia funds a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. As with all components of my determinations, I require sound evidence before accounting for the effects of intensive silviculture on possible harvest levels. Nonetheless, I will consider information on the types and extent of planned and implemented practices as well as relevant scientific, empirical and analytical evidence on the likely magnitude and timing of any timber supply effects of intensive silviculture.

Some have suggested that, given the large uncertainties present with respect to much of the data in AAC determinations, any adjustments in AAC should wait until better data are available. I agree that some data are not complete, but this will always be true where information is constantly evolving and management issues are changing. Moreover, in the past, waiting for improved data created the extensive delays that resulted in the urgency to redetermine many outdated AACs between 1992 and 1996. In any case, the data and models available today are superior to those available in the past, and will undoubtedly provide for more reliable determinations.

Others have suggested that, in view of data uncertainties, I should immediately reduce some AACs in the interest of caution. However, any AAC determination I make must be the result of applying my 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 may need to make allowances for risks that arise because of uncertainty.

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 38. It is also independent of any decision by the Minister of Forests with respect to subsequent allocation of the wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the Ministry of Forests (MOF) as set out in Section 4 of the *Ministry of Forests Act*, and of my responsibilities under the *Forest Practices Code of British Columbia Act*.

The role of the base case

In considering the factors required under Section 8 of the *Forest Act* to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review program for TSAs and TFLs. For TFLs, the analysis work is carried out by licensees and reviewed by BCFS analysts and field staff.

For each AAC determination a timber supply analysis is carried out using an information package including data and information from three categories—land base inventory, timber growth and yield, and management practices. Using this set of data and a computer model, timber supply forecasts are produced. These include sensitivity analyses to assess the timber supply effects of uncertainties or changes in various assumptions around a baseline option, normally referred to as the “base case” forecast.

The base case forecast may incorporate information about which there is some uncertainty. Its validity—as with all the other forecasts provided—depends on the validity of the data and assumptions incorporated into the computer model used to generate it. Therefore, much of what follows in the considerations outlined below is an examination of the degree to which all the assumptions made in generating the base case forecast are realistic and current, and the degree to which its predictions of timber supply must be adjusted, if necessary, to more properly reflect the current situation.

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

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

For TFL 38, the base case projection indicated an initial harvest rate of 250 500 cubic metres per year. This level, which is 4.8 percent lower than the current AAC of 263 000 cubic metres, is consistent with the licensee’s strategy of achieving an initial harvest level within 5 percent of the current AAC. Other harvest flow policies included the maximization of short-term levels such that reductions are limited to less than 10

percent of the harvest level prior to each reduction, a stable long-term harvest level is achieved, harvest occurs proportionately from each operability class, and at no point in time are harvest levels allowed to drop below the long-term level. In the base case, the harvest level of 250 500 cubic metres is maintained for a period of 10 years, followed by reductions of 5 percent in the second decade, 7 percent in the third decade, and 10 percent in each succeeding decade to decade 8, at the end of which it decreases by 9 percent to a long-term harvest level of 125 000 cubic metres beginning in decade 9.

Timber supply analysis

The timber supply analysis for TFL 38 was conducted by Timberline Forest Inventory Consultants Limited (Timberline) on behalf of International Forest Products Limited (the “licensee”).

Timberline used the BCFS computer simulation model Forest Service Simulator (FSSIM). Based on previous experience in examining results from this model, I am satisfied that it is capable of providing a reasonable projection of timber supply.

In the licensee’s timber supply analysis, the ‘Current Management Strategies’ option is intended to reflect the licensee’s current management strategies for TFL 38. This option represents the base case analysis—the results of which are discussed above under “The role of the base case”—and forms the basis for comparison with other management options and sensitivity analyses. This analysis also forms the basis of the licensee’s recommendation for an AAC of 250 500 cubic metres for TFL 38.

Sensitivity analyses were provided with the timber supply analysis to assess the risk to timber supply resulting from uncertainty in data, assumptions and estimates. The licensee also provided alternative forecasts based on other harvest flows or assumptions, as noted in the relevant sections following. All of these analyses have been of assistance to me in considering the factors leading to my determination.

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

Section 8 (7)

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

- (a) the rate of timber production that may be sustained on the area, taking into account**
 - (i) the composition of the forest and its expected rate of growth on the area**

Land base contributing to timber harvest

- general comments

The area of TFL 38 as reported in the licensee's timber supply analysis is 218 616 hectares. Non-productive areas account for 157 893 hectares, leaving a total productive forest land base of 60 723 hectares, or 27.8 percent of the total TFL area.

As part of the process used to define the timber harvesting land base—i.e. the land base estimated to be economically and biologically available for harvesting—a series of deductions were made from the productive forest land base. These deductions accounted for the factors which effectively reduce the suitability or availability of the productive forest area, for economic or ecological reasons. In timber supply analysis, assumptions, and if necessary, projections, must be made about these factors prior to quantifying appropriate areas to be deducted from the productive forest area in order to derive the timber harvesting land base. These factors are described in detail below.

After deductions, the long-term timber harvesting land base for TFL 38 is estimated to be 35 541 hectares—59 percent of the productive area, or 16.0 percent of the total TFL area. That is, from the TFL area of 218 616 hectares, a total of 183 075 hectares were excluded from contributing to the timber harvest, as detailed in the following sections.

- low-productivity sites

For the timber supply analysis, all sites, regardless of productivity, were assessed by the licensee to determine an appropriate harvesting system and the economic viability (see also *economic and physical operability*). Some low-productivity sites were categorised as inoperable, others were deemed operable and included in the timber harvesting land base.

Squamish Forest District staff raised a concern about the licensee's inclusion, in the timber harvesting land base, of 1342 hectares of stands classified as site index 5—i.e. stands aged 141 years and older, with heights ranging from 2.5 metres to 7.4 metres. These are considered to be sites of very low productivity and comprise nearly 4 percent of the timber harvesting land base. The licensee stated that during July 1996, aerial reconnaissance of the entire TFL was undertaken for an overview assessment of operability, followed by numerous ground checks during which it was found that tree heights on some site index 5 stands had been underestimated.

The timber harvesting land base also includes a substantial area of site index 10 stands (10 423 hectares, nearly 29 percent of the timber harvesting land base), also considered to be of low productivity. With the inclusion of the site index 5 stands, this means that nearly 33 percent of the timber harvesting land base—a relatively high proportion—consists of sites that are considered to be of low productivity and that have not generally been included in the timber harvesting land bases for other coastal forest

management units. For this reason I have examined this issue in this TFL more critically than in some other management units with much smaller components of the timber harvesting land base in these low site indices.

In coastal management areas, site index 5 stands are not considered merchantable. Even though the licensee has verified that some of these sites may have been under-classified, I find it unlikely that the productivity of the site index 5 stands has been underestimated to such an extent that they are all in fact merchantable. If the licensee can carry out the necessary inventory work to quantify the extent of the underclassification of these stands to a reliable degree, I will accept the inclusion of the appropriate areas in the timber harvesting land base for the next analysis and AAC determination. However, in the absence of such quantified information, for the purposes of this determination I am unable to assess the magnitude of a suitable inclusion for site index 5 stands, and I have therefore decided that without further validation the inclusion of site index 5 stands in the timber harvesting land base is inappropriate at this time.

The licensee provided a sensitivity analysis showing that when the operable land base was reduced by 5 percent, the timber supply was reduced by 5.7 percent in the short, medium and long terms—an almost linear relationship. Thus if the operable land base were to be reduced by 1342 hectares—approximately 4 percent—the timber supply could be reduced by a roughly corresponding percentage.

In view of this, in my determination I have assumed that the base case has overestimated the timber supply in the short, medium and long terms by something less than 4 percent, as discussed further under “Reasons for Decision”.

If inventory work verifies the underclassification of a significant portion of the site index 5 stands, then the future timber supply in the TFL will be enhanced to the degree that the regenerated volumes expected after harvesting on these sites are correspondingly underestimated.

- economic and physical operability

As noted above, the licensee carried out aerial reconnaissance over the entire TFL during July 1996 to assess operability. Numerous ground checks were also undertaken, focussing primarily on assessing helicopter logging potential and the viability of marginally economic stands, to verify the aerial assessments.

The licensee assessed the timber harvesting land base by physical and economic limitation, using four operability categories—conventional, helicopter, marginal, and inoperable—mapped to a scale of 1:20 000. In the base case, 12 633 hectares were deducted from the productive forest area to account for areas classified as physically or economically inoperable for harvesting by current methods, leaving a short-term timber harvesting land base of 36 609 hectares (including 465 hectares of current not-satisfactorily restocked area). Following this deduction for inoperability, the respective

contributions to the timber harvesting land base from the three classes of operability were: conventional (82 percent), helicopter (13 percent) and marginal (5 percent).

For classification of the helicopter and conventional harvesting categories, operability mapping was based on the merchantability of stands projected over the next twenty years, while for marginally economic stands (1928 hectares), operability was based on the licensee's assessment of their merchantability considering economic opportunities over the past five years. The marginally economic category includes physically accessible areas with harvestable volumes averaging 250 to 400 cubic metres per hectare.

In reviewing the licensee's operability assessments, Squamish Forest District staff raised concern over the inclusion, in the operable land base, both of marginally economic stands and 4878 hectares of hemlock, cedar and balsam "831" and "931" stands. These latter are mature and over-mature stands, aged 141 years or greater, with heights of 20 to 28 metres, and comprising at least 76 trees per hectare, with minimum diameters of 27.5 centimetres at breast height. District staff noted that while they agree the stands in question are accessible, in their view some of these stands may occur in environmentally sensitive areas with respect to soil or terrain, or on sites where regeneration problems are likely to be encountered following timber harvesting (see below, Impediments to prompt regeneration), that were not classified as environmentally sensitive areas in the forest inventory.

To examine the implications for timber supply of including or excluding the 831/931 stands, the licensee conducted a sensitivity analysis in which 40 percent of them were excluded from the timber harvesting land base. This resulted in an immediate but small annual reduction of 3000 cubic metres, or 1.2 percent of the initial harvest level. While this may accurately show the impact of removing 40 percent of these stands, at this time I have no conclusive evidence from which to determine what, if any, percentage of these stands is in fact required to be excluded from the timber harvesting land base. It may well be that some percentage of them should be excluded for the reasons identified by district staff, and I understand that the licensee agrees some level of exclusion is appropriate. To the small extent that the hemlock 831 and 931 stands overlap the site index 5 stands (33 hectares), I have already excluded them as discussed above. However, until the magnitude of the appropriate reduction factor for the remainder of these stands (about 4800 hectares) is determined, I cannot make any quantitative adjustment to the base case projection on this account. Nevertheless, in my determination I have considered the uncertainty introduced by this concern as a small potential risk to the supply, and I have taken this into account as noted in "Reasons for Decision".

With regard to the marginally economic stands, these are defined as stands that contain from 250 to 400 cubic metres per hectare and that are of marginal economic viability for harvesting under normal market conditions. They are comprised primarily of low-productivity stands with site indices between 5 and 10. The 20-year plan projects no harvesting of these stands in the short term, but in the timber supply analysis, harvesting is assumed to begin immediately although their contribution does not actually become

critical to the base case until the third decade. The licensee provided a sensitivity analysis showing the impact on the base case of *not* harvesting marginally economic stands for the first twenty years of the harvest forecast, and the result was no impact on the short-, medium- or long-term timber supply.

While acknowledging this result, I am nevertheless concerned that, over time, ongoing deferral of the harvest of these stands would introduce a growing risk of uncertainty to the timber supply, as the projected harvest levels would become predicated on an increasing proportion of the harvest coming from stands of lower economic viability. My exclusion of the site index 5 stands, noted above, will remove about 295 hectares of marginally economic stands from the timber harvesting land base, which are thus already accounted for. I have assumed that the site index 10 marginally economic stands will continue to contribute, and the licensee has now included one marginally economic cutblock in the five-year development plan for TFL 38. However, analysis shows that removal of all marginally economic stands would produce an immediate 1.6 percent reduction in the timber supply, and the longer harvesting in these stands is postponed, the more critical becomes their contribution to the viability of the base case forecast. In my judgment, therefore, until performance is proven, there is an unquantified risk, small at this point, but increasing over time, associated with the assumption of harvesting in all these stands, and I have taken this into account in my determination as discussed under “Reasons for Decision.”

The operability flights and numerous ground checks attest to the licensee’s efforts to account realistically for the timber supply contribution from both the 831/931 and the marginally economic stands. However, at this time neither the licensee nor the Squamish Forest District has definitive, quantifiable information reflecting current practice in these stands, and the feasibility of harvesting in them remains largely unknown. If the licensee wishes to continue to include these stands in the timber harvesting land base for future timber supply analyses this considerable uncertainty must be addressed. Over the term of Management Plan No. 8, I expect the licensee both to show performance in these stands, and to gather further information on the economic viability of the various components of the operable land base, particularly the 831/931 and the marginally economic stands.

- environmentally sensitive areas

Environmentally sensitive areas (ESAs) in TFL 38 have been inventoried and were submitted to the BCFS in 1996 as part of the preparation for Management Plan No. 8. ESA categories of highly sensitive areas (ESA1) and moderately sensitive areas (ESA2) have been assessed for soils with respect to terrain and slope stability, including snow avalanching, and recreation (discussed below under *recreation areas*).

Terrain stability mapping was completed for TFL 38 in 1995. At that time, only areas considered to be operable were evaluated. In addition, terrain-attribute data has been collected in TFL 38 as part of the BCFS research program into landslide activity in coastal mountains. This data records terrain types and attributes for logged terrain that is about 6 to 15 years old, as well as the presence or absence of landslides. Terrain types with specific attributes associated with the absence and presence of landslide activity were categorized and correlated with similar terrain in other parts of the TFL which have yet to be logged. Land base exclusions for areas with terrain types and attributes associated with landslides were estimated based on Forest Practices Code harvesting standards and were established by the licensee as 90 percent for Es1 areas (highly sensitive soils), and 10 percent for Es2 areas (moderately sensitive soils). This procedure and the net-down factors were approved for use in the timber supply analysis by the Research Geomorphologist in the Vancouver Forest Regional Office, and resulted in a reduction to the timber harvesting land base of 2890 hectares.

Based on my review of the methodology applied, and on the basis of the acceptance of Es1 and Es2 areas by Vancouver Forest Regional staff, I am satisfied with the data used and assumptions made in the timber supply analysis, respecting terrain sensitive soils.

- non-commercial brush

Eight hectares were classified as stands dominated by non-commercial brush and were excluded from contributing to the timber harvesting land base. At present, the licensee has no plans to rehabilitate these areas. I am satisfied that no adjustment to the base case projection is required with respect to sites classified as non-commercial brush.

- deciduous forest types

In the timber supply analysis, only coniferous volumes contributed to the timber supply. This included the coniferous component within stand types dominated by deciduous species. A total of 1656 hectares of deciduous-leading stands are identified in the inventory for TFL 38. Of these, 620 hectares were included in the timber harvesting land base.

In the timber supply analysis it was assumed that, following harvest, 310 hectares of deciduous stands within the timber harvesting land base will be converted to coniferous stands and 310 hectares will remain permanently as deciduous (cottonwood) stands. Squamish Forest District staff are concerned that in view of biodiversity considerations it is improbable to assume that 50 percent of the deciduous-leading stands will be converted.

To the extent that deciduous-leading stands are not harvested and converted to coniferous stands, there will be a small reduction in the medium- and long-term timber supplies. However, there would be no perceptible impact in the short term as these stands are scheduled to be harvested over a period of over 60 years. In any case, I believe it is reasonable to assume that over the term of the forecast period, there will be some

harvesting in deciduous stands. For these reasons I do not consider this issue to introduce a significant risk to the timber supply, and have made no adjustment on this account. Nevertheless, in view of the concerns raised by Squamish Forest District staff, I expect the licensee to clarify the management objectives for deciduous-leading stands, to monitor the conversion of these stands, and to report on this issue in the next management plan.

- roads, trails and landings

In the timber supply analysis, to account for *existing* roads, trails and landings, a deduction of 4 percent was applied to the portion of the productive forest land base covered by stands less than 41 years old. This resulted in a reduction of 456 hectares. The projected impact from *future* roads, trails and landings was accounted for by a 4-percent reduction to the area in stands currently older than 41 years, applied after the first harvest. This resulted in a further reduction to the current timber harvesting land base of 1068 hectares.

Squamish Forest District staff believe that the road deductions applied in the timber supply analysis are too low, in that they underestimate losses incurred by current road construction practices, mainly by assuming road widths that are narrower than observed in practice. They also felt that in the future, roads will be built in terrain that is more rugged and steeper than in the past, requiring wider roads. They suggest that reduction factors of 6 and 5 percent respectively would be more appropriate for current and future roads, trails and landings.

The licensee stated that its 4-percent estimate for current roads reflects the belief that losses in productivity are less than the actual roaded forest area, noting that trees adjacent to road openings exhibit higher growth rates than those in the interior of stands, offsetting the need to use a higher reduction factor for current roads. The licensee also suggested that the 4-percent reduction for future roads may overestimate the actual area required for future roads because of the reduced road densities associated with helicopter operations planned for the TFL.

To assess the risks associated with larger road deductions, a sensitivity analysis was performed, increasing deductions for *existing* roads to 5 percent and for *future* roads to 6 percent. The results showed no timber supply impact in the short term, a small reduction reflected in a higher rate of decline in the mid term, and negligible impact in the long term.

Considering the steep and rugged terrain of TFL 38, and the results of the sensitivity analysis, it is reasonable to expect that the timber supply could be constrained in the mid term by up to one percent from that projected in the base case analysis. While I have been mindful of this in my determination, as noted in “Reasons for decision”, since the sensitivity analysis showed no impact in the short term from an increase in road allowance, I have made no specific adjustment on this account.

The BCFS is currently developing more rigorous procedures which will assist in reducing uncertainties in deriving land base allowances for roads, trails and landings, for use in future timber supply analyses.

- Elaho-Clendenning provincial park area

As part of the Lower Mainland Protected Area Strategy (LMPAS), the Elaho-Sims-Clendenning area was recommended to government on August 27, 1996, as a Goal 1 protected area. On October 28, 1996, the provincial government announced its intention to protect the Elaho Clendenning area as a provincial park as part of the LMPAS. The protected area boundaries were signed by the Chair of the Lower Mainland Inter-Agency Committee on June 25, 1998, and by British Columbia's Surveyor General on June 29, 1998. The park overlaps the north-central area of TFL 38, and includes 6406 hectares of productive forest land formerly lying within the TFL.

In the timber supply analysis, 6406 hectares were deducted from the productive forest land base in anticipation of the creation of the announced Elaho-Clendenning protected area.

While the park has not yet been formally designated by order in council, in view of the government's public announcement of the protected area as part of the overall strategy for protected areas in the Lower Mainland Area, and in view of the boundary ratification by both the Lower Mainland Inter-Agency Committee and the Province's Surveyor General, it is reasonable to assume that no harvesting will take place in this area, and I have therefore assumed that the area does not contribute to the timber supply in the TFL.

For these reasons I have concluded that the 6406-hectare deduction made in the analysis to reflect the planned protection of this area is appropriate. I am therefore satisfied that the base case projection accounts adequately for the creation of this new protected area.

- Tantalus park area

A small portion, less than 100 hectares, of the Tantalus provincial park area announced by government as part of the Lower Mainland Protected Areas Strategy overlaps with TFL 38. The overlapping area consists of an alpine lake and alpine tundra, and no productive forest is involved. Thus the protection of this area will not in any way affect the timber supply in the TFL.

Existing forest inventory

- current inventory

The forest inventory for TFL 38 is based on aerial photograph interpretation prepared by Weldwood of Canada Limited in 1981. An inventory of second-growth stands over 10 years of age was completed in 1987. Since then the inventory has been updated annually for harvesting, road construction, reforestation, and silvicultural treatments. The most recent inventory update for TFL 38 was completed by the current licensee in 1997, incorporating changes to the end of 1996. Changes to the TFL area—including the Clendenning protected area—are incorporated to 1998.

I note that while the licensee has kept the inventory up to date, a question has been raised, as discussed earlier under *low-productivity sites*, about the extent to which tree heights in the TFL—particularly for site index 5 stands—may have been underestimated. An inventory audit is scheduled for 1998, the results of which will provide clarity on tree height estimations for the entire TFL.

Until the 1998 inventory audit is complete, I am satisfied that the current updated inventory data provides the best available information and is therefore appropriate for use in this determination. Findings from the audit should resolve outstanding questions regarding height estimation, and will be considered in the next timber supply analysis and AAC determination for TFL 38.

- age-class distribution

Approximately 65 percent of the timber harvesting land base is covered by stands more than 250 years old, 3.2 percent by stands between 141 to 250 years old, 1.1 percent in stands between 101 to 140 years old, 3.6 percent in stands between 40 to 100 years old, 10.5 percent in stands between 21 and 40 years old, and 16.6 percent in stands aged 0 to 20 years old.

- species profile

The timber harvesting land base consists mainly of stands comprised primarily of western hemlock, Douglas-fir, balsam, western red cedar and a minor component of cottonwood. No issues were identified with respect to appropriate harvesting of species in proportion to their presence on the TFL land base.

- volume estimates for existing stands

To project stand yields for this timber supply analysis, each stand in the inventory was assigned to one of three categories: *immature* (less than 31 years old), *thrifty* (31 to 140 years old), or *mature* (greater than 140 years old). Natural stand volumes were modelled using natural stand yield tables for thrifty stands and average volume line volumes for mature stands. Immature stands were

considered to be managed stands and are discussed under *volume estimates for regenerated stands*.

Yield tables for existing *thrifty* unmanaged stands were developed with the BCFS Variable Density Yield Prediction (VDYP—version 6A) program. VDYP is based on information gathered from a large number of sample plots and is generally accepted in British Columbia as a suitable means of estimating volumes in existing stands.

Existing *mature* unmanaged stands were assigned volumes based on a localized set of inventory plots. A total of 920 plots were established, of which 742 are in the operable land base. Leading species and site index data from these plots were used to generate analysis units. To estimate mature volumes, the analysis relied on Average Volume Line (AVL) estimates rather than on VDYP estimates. The AVL estimates were on average about 15 percent lower than the VDYP estimates.

The licensee provided a sensitivity analysis evaluating the impact of increasing by 15 percent the base case AVL-derived volume estimates for existing mature stands. The results showed that under this condition the initial base case harvest level of 250 000 cubic metres could be extended for an additional decade. Also, mid-term harvest levels were increased up to 15 percent above base case levels.

In assessing what weight to place on the possibility of an underestimation in mature volumes in existing stands, I am advised by BCFS staff that the AVL estimates are subject to some uncertainty arising from aggregation procedures which resulted in some analysis units being comprised of small areas containing relatively few AVL plots. However, the VDYP estimates against which the AVL-derived volumes were compared were not based on localized data and are also subject to uncertainty. I am advised by staff of Resources Inventory Branch that, despite the uncertainty due to the small numbers of plots, the AVL process, being based on local data, likely provides the more reliable representation of the mean stand volume.

I must therefore conclude that no statistically valid basis has been provided for an assessment of a likelihood of an underestimation in the existing mature stand volumes. Since the AVL volumes used in the analysis were derived from specific localized plot information, and based on the advice of specialist BCFS staff, I have decided to accept the AVL estimates as the best currently available information. In my determination I have therefore made no accommodation for an under-, or overestimation in these volume estimates.

In making my determination on this basis I have been mindful that the licensee is aware of the implications of the discrepancy in volume estimates and will be conducting further studies to assess growth, decay, and waste and breakage factors, and the effects of all these on existing stand volumes. A better accounting of existing stand volumes should therefore be available for consideration in future

AAC determinations, and the inventory audit planned for TFL 38 in 1998 should help in clarifying the uncertainty.

Expected rate of growth

- site productivity estimates

Inventory data includes estimates of site productivity for each forest stand, expressed in terms of a site index. The site index is based on the stand's height as a function of its age. The productivity of a site largely determines how quickly the trees on it will grow, and therefore affects the time seedlings will take to reach green-up conditions, as well as the volumes of timber that will grow, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size or a minimum harvestable age.

Generally, stands between 30 and 150 years of age provide the most accurate measurement of site productivity. Site indices determined from both young stands (less than 31 years old), and old stands (over 150 years old) may not accurately reflect potential site productivity. In young stands, growth often depends as much on recent weather, stocking density and competition from other vegetation, as it does on site quality. In old stands, which have not been subject to management of stocking density, the trees used to measure site productivity may have grown under intense competition or may have been damaged, and therefore may not reflect the true growing potential of the site. This has been verified in other areas of the province where studies suggest that actual site indices may be higher than those indicated by existing data from mature forests.

In the base case, site indices were assigned to stands less than 31 years old using the mid-point site index values and "special-site" class. Site indices for stands over age 30 were calculated using current MOF recommended site index curves.

To represent the productivity of sites currently occupied by stands older than 140 years following their harvest and regeneration, the licensee proposed using in the analysis site index adjustments based on species and biogeoclimatic subzones. However, BCFS Research Branch staff concluded that the proposed adjustments at the subzone level were unsubstantiated and could result in large margins of error at the stand level. The proposal was therefore not accepted as an adjustment to the base case. Instead, the licensee provided sensitivity analysis showing that yields would be higher throughout the forecast period if the site index adjustments were applied.

I accept that the province-wide studies referred to above show that site indices in older stands are often underestimated and I have therefore considered seriously the demonstrated *potential* for higher site productivity in mature stands for TFL 38. However, the adjustments proposed by the licensee on which the sensitivity analysis is based are not sufficiently statistically validated to support a particular quantified increase in the timber supply at this time. The licensee should continue to consult with BCFS staff regarding acceptable methods for adjusting site indices. Meanwhile, for this determination, I accept the site productivity assumptions used by the licensee in the base

case as reflective of the best currently available information. Therefore, acknowledging the possibility of some adjustments to be accounted for in future, for this determination I have made no adjustment on this account to the projected harvest levels in the base case.

- volume estimates for regenerated stands

Immature stands less than 31 years old were treated in the analysis as managed stands. Existing stands were assumed after harvest to be regenerated as managed stands, retaining the 'thrifty' or 'mature' site index held before harvesting (see above, *volume estimates for existing stands* for definitions). Volume estimates for managed stands were developed using WinTIPSY v1.3, with operational adjustment factors (OAFs) applied as noted below in *decay, waste and breakage*. The estimates were accepted by BCFS Research Branch on October 15, 1997 for use in the analysis.

The timber supply analysis information package for the TFL identifies an Enhanced Resource Management Development Zone for future activities. However, little intensive silviculture that could potentially affect regenerated volumes is currently practiced and none was incorporated into the base case.

I am satisfied that the regenerated volumes as modelled reflect the best information available at this time, and I have accepted their use as incorporated in the base case timber supply projection.

- minimum harvestable ages

A minimum harvestable age is an estimate of the earliest age at which a stand has grown to a harvestable condition. Changing the minimum harvestable age mainly affects when second growth will be available for harvest and how quickly existing stands may be harvested. In practice, many forest stands will be harvested at much older ages than the minimum harvestable age, 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, all existing mature stands in the timber harvesting land base were assumed to be eligible for harvest. For managed stands which have achieved a minimum volume of 250 cubic metres per hectare (including waste and breakage) by the time they have reached their maximum average growth rate—i.e. the culmination of mean annual increment (MAI)—the minimum harvestable age was assumed to be this culmination age, which was between 70 and 100 years. For analysis units which reach culmination age with less than the minimum 250 cubic metres per hectare, the minimum harvestable age was defined as the age at which this volume is achieved.

Squamish Forest District staff are concerned that the minimum volume criterion of 250 cubic metres per hectare is too low to be operationally feasible. In the adjoining Soo Timber Supply Area, 350 cubic metres per hectare by age 140 years is considered the minimum operable volume.

The licensee provided sensitivity analysis showing the impact of increasing or decreasing minimum harvestable age by ten years. The decrease produced higher harvest levels after decade one, while the increase produced lower levels beginning immediately.

In view of my concern about the licensee's inclusion of low productivity sites in the timber harvesting land base, as noted earlier I have not accepted the inclusion of the very low productivity site index 5 areas and I have adjusted my assessment of the timber supply for the TFL accordingly (see "Reasons for Decision").

Having considered the sensitivity analysis provided, I am satisfied that this adjustment accounts adequately for any risk to the timber supply caused by the inclusion of low-productivity sites, and that no further accounting for their particular effect on minimum harvestable ages is required. I have also considered that any validation of the suspected underestimation of site productivity in analysis units of site index 10 or greater would result in volumes per hectare greater than the minimum of 250 cubic metres per hectare at the minimum harvestable ages as modeled in the base case, which would help to reduce any remaining uncompensated risk on this account.

I have therefore made no specific adjustment to the timber supply with regard to uncertainty in minimum harvestable ages.

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

Regeneration delay

Regeneration delay is the period between harvesting and the time at which an area becomes occupied by a specified minimum number of acceptable, well-spaced seedlings. The timber supply analysis assumed an average two-year regeneration delay for both planted and naturally-regenerated stands. The licensee's strategy in MP No 8 is to plant within one year of harvesting on most areas.

The licensee provided a sensitivity analysis showing the impacts of increasing and decreasing the regeneration delay by one year, to account for possible variations in sites and type of regeneration. Increasing the delay to three years caused a minimal decrease in the timber supply in the short, medium and long terms, and decreasing the delay to one year caused no notable change in the timber supply. Having considered the uncertainties associated with this factor I am satisfied that the assumption in the base case is acceptable for use in this determination and that any reasonably expected variations from current

performance introduce very little risk to the projected harvest levels in the base case analysis.

Impediments to prompt regeneration

Squamish Forest District staff have expressed a concern that many of the marginally economic stands and approximately 40 percent of the stands classified as “831/931” may be difficult to regenerate. They noted that many of these stands are located on sites that are on potentially sensitive terrain, at higher elevations, or both.

The prospect of harvesting on sites which cannot be successfully regenerated is under any circumstances a proper cause for concern. In the present case I note that the licensee’s silviculturist does not anticipate regeneration difficulties, and that the licensee has stated its intention to apply more intensive treatments to ensure successful regeneration in the event that such problems should arise.

In view of the minimal timber supply impact of increasing the regeneration delay to three years (see above, Regeneration delay) and on the basis that the licensee will take appropriate actions to immediately address any regeneration problems that may arise in the marginal or “831/931” stands, I do not consider it necessary at this time to make any adjustment to the projected timber supply on this account. However, I request the licensee, over the course of Management Plan No. 8, to improve information on the extent and distribution of any stands that are difficult to regenerate, in order to gain a better understanding of this issue for the next AAC determination.

Not-satisfactorily-restocked areas

Not-satisfactorily restocked (NSR) areas are those where timber has been removed, either by harvesting or by natural causes, and a stand of suitable species and stocking has yet to be established. Areas where the standard regeneration delay has not yet elapsed are considered “current” NSR. Where a suitable stand has not been regenerated and the site was harvested prior to 1987, the classification is “backlog” NSR.

Licensee records indicate that TFL 38 contains 465 hectares of current NSR areas within the operable land base, and no backlog NSR. All of the current NSR is scheduled to be restocked within the two-year regeneration delay period. Squamish Forest District staff agree with this assessment. For the timber supply analysis the NSR sites were assumed to be of medium productivity distributed to analysis units based on the area distribution of existing stands. An accounting of the hectares in question by analysis unit and by species was provided and I am satisfied that the timber supply analysis accounts adequately for NSR for this determination.

(iii) silvicultural treatments to be applied to the area:Silvicultural systems

The majority of TFL 38 is dominated by rugged terrain and soil conditions which will limit the use of ground-based equipment in favour of traditional cable harvesting systems. The licensee utilizes helicopters to log in areas where accessibility and terrain sensitivity are of concern. The use of skyline systems is also being explored for these areas.

Public concern was expressed that there should be an increase in the use of alternative silvicultural systems in managing TFL 38. Squamish Forest District staff noted that currently 10 percent of the harvest level must be achieved with silvicultural systems other than clearcutting. The licensee has made a commitment to examine various silviculture systems during the term of Management Plan No. 8, to determine and implement the most appropriate forest management activities. While I strongly encourage the continued exploration of alternative silvicultural systems, no quantifiable impacts on the projected timber supply from the use of alternative systems are currently identified, and I have made no adjustment to the projected timber supply on this account.

Intensive silviculture

In general, intensive silviculture activities include activities such as commercial thinning, juvenile spacing, pruning, fertilization, and genetic improvement. These treatments are discussed below under the appropriate headings.

- brush treatments

No brushing treatments were assumed in the timber supply analysis, and none are carried out in current practice. In Management Plan No. 8 the licensee states that brushing of site-specific areas will occur as early as operationally feasible, where stocking standards are not achieved or when improved timber growth performance is desirable. It is also noted that brushing may occur at various times until plantation establishment has reached free-growing status. The growth and yield implications of brushing are improved distribution and a greater amount of natural regeneration, improved distribution of planted trees, and reduced growth delay. If and when these brushing treatments become current practice, their implications for timber supply will be reviewed in future AAC determinations.

- commercial thinning

Commercial thinning is the harvesting, in a maturing stand, of trees large enough to be considered a commercial product. While single-entry commercial thinning regimes do not generally increase total volume yields on a specific site, they can provide opportunities to harvest timber in areas where harvesting is limited to meet a variety of other resource objectives.

Commercial thinning is not currently carried out on or planned for TFL 38 and none was assumed in the timber supply analysis. I am therefore satisfied that in this regard the base case projection adequately reflects current practice.

- genetic improvement

The licensee has made some use of genetically improved planting stock on the TFL since 1995. However, gains in volume and growth from planting genetically improved seedlings were not incorporated in the projected regenerated stand yields used in the timber supply analysis base case. The licensee did provide a sensitivity analysis evaluating the impact of using genetically improved seedlings, in which gains of 5 percent were incorporated in the projection of regenerated stand yields for Douglas-fir/hemlock stands, and 3 percent for cedar stands. The results showed no change in the short-term timber supply, a 2.1 percent gain in the medium term, and a 1.9 percent gain in the long term.

BCFS Research Branch staff are concerned that yield gains for genetically improved cedar stock are not yet reliably validated, and caution that the 3 percent gain modelled in the sensitivity analysis may be too high. Nevertheless, I believe that in the future the use of genetically improved stock will produce average yield gains higher than those modelled in the base case, and I have taken this into consideration in a general way in my determination, as discussed under “Reasons for Decision”.

In Management Plan No. 8, the licensee states that enhanced silviculture, designed to enhance non-timber resource values and timber yields, could be undertaken in conjunction with funding from FRBC, or similar funding mechanisms. This expression of interest could potentially lead to the realization of valuable benefits in the future. However, without any comprehensive strategy or proven application of such activities in the TFL, for the present determination I have no indication of any short-term implications for timber supply that should be accounted for. I have noted and taken into consideration in a general way the potential for future gains from genetic improvement. If and when enhanced silvicultural treatments become current practice their implications will be reviewed and incorporated in future AAC determinations.

- (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:**

Utilization standards

Utilization standards define the species, dimensions and quality of trees that must be harvested and removed from an area during harvesting operations. In the timber supply analysis, for existing natural stands, the utilization standards assumed were a minimum 17.5-centimetre diameter at breast height (dbh) with a 30-centimetre stump and 15-centimetre top inside bark. For regenerated stands, the assumed standards were a 12.5-centimetre minimum dbh with a 30-centimetre stump and a 10-centimetre top inside bark.

These assumed standards are consistent with current practice in the TFL and are therefore acceptable for use in this determination without adjustment to the projected timber supply.

Decay, waste and breakage

The Variable Density Yield Prediction model used in the timber supply analysis to estimate volumes in existing natural stands more than 30 years old incorporates standard provincial reduction factors to account for decay, waste and breakage. BCFS Resources Inventory Branch reviewed and approved the loss factors applied in the analysis for TFL 38.

The Table Interpolation Program for Stand Yields (TIPSY) used in the timber supply analysis to estimate volumes for regenerated stands (see *volume estimates for regenerated stands*), incorporated Operational Adjustment Factors (OAFs): OAF 1 (15 percent) was applied for unmapped stand openings; and OAF 2 (5 percent) was applied to account for pests and diseases, and for decay, waste and breakage. This methodology was approved by BCFS Research Branch for use in the timber supply analysis.

As noted under *volume estimates for existing stands*, the licensee has concerns regarding the decay, waste and breakage factors for existing mature stands, believing them to be too high. In Management Plan No. 8, the licensee has committed to undertake destructive sampling to obtain additional data. When the new information is available, its implications for timber supply will be reviewed in future AAC determinations.

For the present determination the estimates incorporated in the analysis constitute the best available information with respect to decay, waste and breakage. I have accepted the applicability of the factors as used and have made no further adjustment to the base case timber supply projection.

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

Integrated resource management objectives

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

- *green-up and adjacency*

To manage for resources such as water quality and aesthetics, current harvesting practices limit the size and shape of cutblocks and maximum disturbances (areas covered by stands of less than a specified height), and prescribe minimum green-up heights required for regeneration on harvested areas before adjacent areas may be harvested. Green-up requirements provide for a distribution of harvested areas and retention of forest cover in a variety of age classes across the landscape.

In the licensee's base case, to account for green-up requirements, a forest cover constraint was applied permitting a maximum of 33 percent of the timber harvesting land base in both general and enhanced management zones (roughly 80 percent of the TFL area) to be harvested and regenerated with forests less than 3 metres tall—i.e. under 16 years old for general management zones, and under 15 years old for enhanced management zones. (The licensee's MP No. 8 used zones based on the recommendations of the Lower Mainland Protected Areas Strategy.)

The licensee analyzed the impact on timber supply of applying a stricter adjacency requirement by reducing the permissible disturbance from 33 percent to 25 percent. The result was no change in the base case timber supply projection, indicating that the forest cover requirement applied for adjacency is not a limiting constraint on supply. This indicates some flexibility in managing the timber supply to accommodate the licensee's commitment to examine various alternative harvesting systems during the term of Management Plan No. 8.

From this I accept that the green-up and adjacency requirements as modelled in the timber supply analysis adequately reflect current practice and do not constrain the short-term timber supply. In my determination I have therefore made no adjustment to the base case projection on this account.

- *visually sensitive areas*

Careful management of scenic areas along travel corridors and near recreational sites is an important IRM objective and is part of the BCFS mandate—the preamble to the *Forest Practices Code of British Columbia Act* identifies the conservation of scenic diversity as a sustainable use of the forests that British Columbians hold in trust for future generations.

The Code enables the management of visual resources by providing for scenic areas to be identified and made known, and by providing for the establishment of visual quality objectives (VQOs). To achieve this, visual landscape inventories are carried out, to identify, classify and record those areas of the province that are visually sensitive. On completion of such an inventory, a specialist may derive recommended visual quality classes (RVQCs) to identify levels of alteration that would be appropriate for particular areas. The Code requires these areas to be identified, by the district manager or in a higher level plan, and to be made known to licensees. When this has been done and an

RVQC has become current, on-the-ground management, it may be incorporated into a timber supply analysis, preferably as a VQO established by the district manager or contained in a higher level plan. Established VQOs reflect the desired level of visual quality, based on the physical characteristics and social concern for an area, and seek to balance the perceptions and needs of people with the social and economic needs of the Province.

VQOs limit the amount of visible disturbance that is acceptable in sensitive areas. To meet the objectives, constraints must be placed on timber harvesting, road building and other forest practices in such areas. The constraints are based on research and experience and on public preferences and acceptance of degrees of alteration of visual landscapes. The constraints are expressed in terms of “forest cover” requirements that relate to the maximum percentage of a viewshed allowed to be harvested at any one time, and to “visually effective green-up” (VEG)—that is, the stage at which a stand of reforested timber is perceived by the public to be satisfactorily “greened-up” from a visual standpoint.

For TFL 38, during 1996 and 1997, the licensee undertook landscape inventory and analysis work, and completed two reports on visual sensitivity in the TFL: (i) *Managing Scenic Values in TFL 38 Consistent with FPC Impact Objectives: Landscape Inventory and Analysis Review and Strategies to Reduce Adjacency Constraints in Scenic Areas*; and (ii) *Landscape Inventory and Analysis International Forest Products Limited Tree Farm Licence 38*. Based on these two reports, scenic areas were identified and made known. The RVQCs were then aggregated into separate zones: retention, partial retention, and modification, each including components for slopes of less than, and greater than, 40 percent, and zonal forest cover constraints were defined for each class.

Visually effective green-up was assumed to occur at three-metre top height for both partial retention and modification zones on slopes less than 40 percent, and at six-metre top height for zones on slopes greater than 40 percent. (Top height is the average height of the tallest 100 trees per hectare for the leading species.) This methodology was approved for use in the timber supply analysis by the Vancouver Forest Regional Landscape Specialist.

I note that the RVQCs were developed in consideration of other objectives now required under the Forest Practices Code and considering the use of improved applications of landscape design techniques. This is consistent with the social and economic objectives of the Crown as expressed by the Minister of Forests in his memorandum of February 26, 1996, regarding VQOs (attached as Appendix 4). In view of this, and of the approval by regional staff of the methodology for representing the VQOs in the analysis, for the purposes of this determination, I am satisfied that the base case timber supply projection appropriately reflects current management of the visual resource values.

- *recreation areas*

Recreation values in TFL 38 range from picnic areas to large expanses of landscapes used for sightseeing and hiking activities. In 1996 the licensee completed a *Recreation Inventory Report*. This inventory includes biophysical, cultural and historic features on TFL 38 and their current and potential recreational use. Procedures for recreation mapping were carried out in accordance with the Ministry of Forests' Recreation Manual.

The licensee identified 1463 hectares of sites with significant recreational values ('ESA Er1') within the productive forest area. The Vancouver Forest Regional Office Recreational Specialist recommended a land base net-down of 90 percent for Er1 areas. In the base case, after other overlapping deductions, a total of 126 hectares were removed from the timber harvesting land base specifically to account for Er1 areas.

The licensee identified 24 306 hectares of "Er2" sensitive areas within the productive forest area; Er2 areas are typically landscapes used for activities such as sightseeing and hiking. In the analysis, no deductions were made for Er2 areas in deriving the timber harvesting land base. Squamish Forest District staff have evaluated the licensee's Er2 prescription, and have concluded that with greater emphasis on harvest block design and smaller block sizes, the prescription appears appropriate. However, as discussed below, district staff remain concerned that integrating the management objectives for timber and for Er2 areas may increase future constraints on the timber supply within the TFL.

In 1996 the licensee completed a *Recreation Analysis and Management Strategy Report* for TFL 38, in accordance with Vancouver Forest Region recreation guidelines. This report identifies, describes, and presents management strategies (recommendations and options) for, lakes and rivers, trails and routes, access, facilities, trap lines, tourism, and archaeological resources and sites in the TFL. Squamish Forest District staff have raised a concern that this report does not reflect all current recreational values in the TFL and that overall, recreational management needs to be increased in the TFL. District staff noted that given the close proximity of the TFL to the city of Vancouver, and the increased level of public awareness of the recreational values associated with areas in the TFL, there is increasing pressure on both the licensee and the Squamish Forest District to increase the level of recreation management within the TFL.

I have considered carefully, and concur with, the observations of district staff regarding probable future increases in recreational activity within TFL 38. Since the area is located near greater Vancouver, in all likelihood, with the creation of Clendenning Park, recreational visits to areas in the TFL will increase.

From this I accept that there are uncertainties regarding the total area that will eventually be required to meet future recreation management objectives on the TFL, but for this determination it is impossible to quantify the extent of the total

area that will be required or what implications this may have for timber supplies. I have therefore considered this in a general way as an unquantified constraint on the base-case projection, which is most likely to affect the medium-to-long-term timber supply, as noted in “Reasons for Decision.”

- *wildlife habitat*

The biodiversity and riparian provisions of the Forest Practices Code are intended to provide for the needs of most wildlife species. However, some wildlife species that are considered to be “at risk” require special management practices. The province’s Identified Wildlife Management Strategy is in the concluding stages of development and is expected to be released in the near future. This strategy will provide direction for managing critical habitat for identified wildlife species that are established in the *Forest Practices Code of British Columbia Act*. Of the 8 species of identified wildlife listed for the Squamish Forest District, six are likely to occur within TFL 38—bull trout, tailed frog, Northern goshawk, marbled murrelet, grizzly bear and mountain goat.

Many wildlife concerns have been accounted for in the timber supply analysis through the representation of practices that protect habitat for large mammals and endangered or threatened birds, and that assist in the implementation of biodiversity strategies.

MELP staff have identified critical habitat areas for mountain goat and moose. Mountain goats are dispersed throughout all five of the watersheds within TFL 38, and MELP has identified mountain goats and their habitat as having significant wildlife value, requiring special management. Critical habitat for mountain goats was identified in 1994 by the former licensee and MELP, and habitat requirements in operable areas will be met by the application of forest cover constraints. In Management Plan No 8 the constraints are described as allowing no more than 20 percent of the operable portion of the mountain goat management zones to contain stands aged between 1 and 20 years, and maintaining at least 20 percent of the area in stands aged 81 years or more. This same constraint was applied in the base case analysis.

One of MELP’s objectives is the maintenance of a “non-consumptive-use” (i.e. no hunting) moose population in the Elaho drainage. The latest assessment of the moose population and its specific habitat requirements in the TFL was conducted in 1988 by the former licensee and MELP. As a result of this work, a Moose Management Zone of critical moose habitat was identified. To preserve a stable moose population, the licensee has committed in MP No. 8 to protect winter range by allowing no more than 30 percent of the operable area in this Zone to contain stands aged between 1 and 20 years, and to maintain at least 20 percent of the Zone in stands aged 61 years or more. This constraint was applied in the base case.

MELP’s Forest Ecosystem Specialist advises that the critical moose and mountain goat management zones and forest cover requirements are approximations to the actual management activities that will occur on TFL 38 for these species; management prescriptions are currently being re-evaluated and could be subject to change. I note,

nevertheless, that the management regime as currently defined was modelled specifically in the base case analysis, and also that the licensee has agreed to adapt its wildlife management in accordance with new information as this becomes available.

The licensee provided analysis showing the sensitivity of the timber supply to changes in forest cover requirements for moose and mountain goat management. The sensitivity analysis demonstrated that a decrease or increase of 5 percent in thermal cover requirements had no impact on timber supply, and that decreasing the area permitted to be below green-up age by 5 percent had no short-term impact but decreased the mid-term timber supply by 0.6 percent. The base case projection thus incorporates a degree of flexibility in meeting these habitat forest cover requirements.

With regard to Northern Spotted Owls, to date none have been found within TFL 38. However, a small portion (about 100 hectares) of the Tantalus Spotted Owl Special Resource Management Zone (SRMZ 21) extends into TFL-38 near the lower reaches of the Ashlu River. Any harvesting activity within this area will be subject to the completion of a Resource Management Plan (RMP) for Spotted Owls. Because the majority of the SRMZ falls within the newly created Tantalus Protected Area, the RMP is not expected to constrain the timber supply in the TFL.

Special management for Black-tailed deer populations is currently being discussed between the licensee, BCFS and MELP. The licensee has made a commitment to adapt specific wildlife management strategies as they become known for both the Black-tailed deer and other species, and I note that these will need to be consistent with recent changes in the Operational Planning Regulation regarding ungulate winter range, which will come into force on October 15, 1998.

From all this, in assessing the adequacy of representation in the base case analysis of the constraints on timber supply that may reasonably be expected regarding wildlife and their habitat, I note the following. I am satisfied that the licensee used the best information available for wildlife habitat at the time the information package was prepared for the timber supply analysis, and that the licensee is continuing to discuss wildlife issues and strategies for TFL 38 at the operational level with MELP and BCFS on an ongoing basis. I note the licensee's commitment, for the term of Management Plan No. 8, that as information becomes available for the management or protection of wildlife habitat, forest management activities will be modified appropriately.

I have considered and am mindful of public concern that for the TFL as a whole, more information is needed on wildlife populations such as the wolf and mountain goat, and that, in the base case, the management of species at risk has not been explicitly quantified and analyzed because specific wildlife habitat areas for some of these species are not presently known. I anticipate that some of these wildlife habitat needs will overlap with, and be provided for by, considerations and objectives for other key resource values such as existing wildlife strategies, riparian zones, landscape-level biodiversity, and wildlife tree patches. I have also concluded below, in *landscape-level biodiversity*, that some

flexibility exists in the base case projection to accommodate additional constraints that may be imposed through planning, and similarly I have noted the flexibility indicated above with respect to increases in cover constraints.

In conclusion, I accept that some uncertainties remain regarding the total area and the constraints required to protect wildlife habitat on TFL 38. With respect to species at risk, I note that government has made a commitment to limit the overall impacts of managing identified wildlife species to one percent of the provincial timber supply. Taking this into account, as well as the flexibilities and management objective overlaps discussed above, I have concluded that the identification of additional habitat requirements may have some impact on the timber supply in the TFL in the future, as noted in my “Reasons for Decision”, but that any potentially associated impacts can be accommodated for the duration of the effective period of this AAC within the initial harvest level projected in the base case analysis, without introducing unacceptable levels of risk to the management of important wildlife habitats.

In this determination, therefore, I have made no further adjustment to the projected timber supply on this account. As the province clarifies its strategy for the management of species at risk, I expect the implications to be reflected in future timber supply analyses for TFL 38, and these will be taken into account in future AAC determinations.

- riparian habitat

Riparian habitats occur along streams and around lakes and wetlands. The Forest Practices Code requires the establishment of riparian management reserves that exclude timber harvesting, and riparian management zones that restrict timber harvesting in order to protect riparian and aquatic habitats.

The licensee notes that its riparian inventory of stream, wetland and lake classifications has some deficiencies. In particular, it does not classify all streams in the TFL, and some fish-bearing streams have been classified incorrectly as non-fish-bearing. MELP raised similar concerns about the riparian inventory and noted that, because it does not capture slope gradients it does not identify changes from fish-bearing to non-fish-bearing in continuous water bodies.

In the timber supply analysis, the management of riparian and aquatic resources was accounted for by the application of “buffers” (riparian management areas or RMAs) ranging from 10 metres for streams classified as S5, to 60 metres for those classified as S1. In addition, all lakes, swamps and wetlands were buffered to 10 metres and were removed from contributing to timber supply. In total, these RMAs resulted in a reduction to the timber harvesting land base of 1595 hectares. While the riparian reserve zones within the RMAs were consistent with the *Riparian Management Area Guidebook*, the total size of some of the RMAs exceeded those recommended in the *Guidebook*, and the licensee notes that these more stringent buffers were applied to offset possible misclassification of some of the S2 streams as S3 in the riparian inventory.

Subsequent to the November 27, 1997 AAC determination meeting, MELP staff carried out a review of stream classifications on the TFL. Twenty-three cut-blocks were surveyed for missing streams and for streams incorrectly classified in the inventory. Extrapolated to the whole TFL, the results indicate that, when the excess area that was applied in RMAs is removed, in total the riparian inventory underestimates land base net-downs recommended by the *Guidebook* by a minimum of 200 hectares, or roughly 0.5 percent of the timber harvesting land base.

The licensee provided a sensitivity analysis showing that if the operable land base were reduced by 5 percent, the initial harvest level would be reduced by a nearly proportional 5.7 percent. This would imply that reducing the operable land base by approximately 0.5 percent to account for riparian requirements identified by MELP would reduce the short-term harvest level by roughly 0.5 percent. While this appears to be a small land base reduction, the actual required reduction is subject to some uncertainty since the figure of 200 hectares is the minimum in an undefined range and the validity of extrapolating from the 23 cutblocks to the whole TFL is untested. Consequently I have considered that riparian management has not been fully accounted for in the timber supply analysis, and that a small but unquantified impact will be felt during the period of this AAC. I have taken this into account in my determination as discussed in “Reasons for Decision.”

The licensee has made a commitment in Management Plan No. 8 to undertake further analysis of streams and water bodies in the TFL in order to provide a better understanding of actual riparian requirements for TFL 38. I hold the licensee to this commitment, and expect that additional information will be available for the next AAC determination.

- cultural heritage

Cultural heritage resources are defined in the *Forest Act* and include archaeological sites, traditional use sites and culturally modified trees (CMTs). Archaeological sites and CMTs that predate 1846 are protected under the *Heritage Conservation Act*. The nature and extent of the protection of archaeological sites is detailed under this legislation.

An archaeological overview assessment has been completed for TFL 38, and archaeological impact assessments are being completed. Squamish Forest District staff believe there may be some pictographs and CMTs within the TFL that have yet to be identified, but this remains to be verified through ongoing assessments. The Mount Currie and In-Shuck-ch/N’Quatquo first nations are conducting traditional use studies documenting areas within the TFL that may require special management. At this time I do not have sufficient information to determine whether or to what extent the results of these studies may affect the timber supply in TFL 38, although I expect the licensee to incorporate any such findings in the next timber supply analysis for the TFL.

I expect that areas of cultural or archaeological significance, including traditional use sites will be considered by the district manager in his administration of the AAC

determined for TFL 38. In this respect, any detailed information gathered during archaeological impact assessments or consultation with first nations may provide information over the term of Management Plan No. 8 that will guide operations on the TFL. This will also permit more accurate assessment, in the next timber supply analysis, of the impacts that may be expected on timber supply from protecting cultural heritage resources.

For the present determination, I am mindful that historically there has been use by First Nations throughout the TFL, and as a result, cultural heritage resources may exist within the TFL. Since it is likely that further archaeological sites will be discovered, there are likely to be timber supply impacts from protecting areas around CMTs and other archaeological sites. Since the analysis made no accounting for cultural heritage sites, if cultural heritage inventories are found to have a significant impact on timber supply, I am prepared to consider revisiting this determination at an earlier date than the five-year review required by the *Forest Act*.

- First Nations' old-growth and old-growth cedar requirements

The Squamish Nation expressed concern regarding the amount of old-growth remaining within their traditional territory in relation to both the volumes and area currently scheduled for future harvest. Their concern is that there is very little old growth left for harvesting that will not incur environmental and cultural impacts on the Squamish Nation. They require access to old-growth forests for traditional practices including gathering medicinal plants and roots for basket makers. They also require access to old-growth cedar for their carvers, totem pole builders and canoe builders, and they require access to alder and maple for their Elders' and long-house fires.

I recognize that many traditional practices, such as canoe building for example, require trees of specific sizes and with other distinguishing characteristics. It may be that there is an aboriginal right associated with access to old-growth forests in general, and to old-growth cedar in particular. While I am mindful of this possibility, to the extent that such a right does exist, it is currently unquantified in extent and nature. The Crown may very well have an obligation to reserve some old-growth, but how much and where are impossible to ascertain in this determination from the information provided.

In addressing these uncertainties I note that the inventory data shows that TFL 38 still contains: 1711 hectares of old growth cedar stands on medium growing sites and 170 hectares on good sites; 1394 hectares of mixed cedar and hemlock stands on medium sites and 192 hectares on good sites; and 3285 hectares of old-growth Douglas -fir on medium sites and 87 hectares on good sites. The total area of the TFL remaining in old growth forests is 24 818 hectares, 41 percent of the total forested area. I also note that over the next five years, harvesting at the proposed AAC would imply a harvested area of approximately 2300 hectares. Given the extent of the remaining old growth, I consider that with sufficient consultation with First Nations, the district manager should be able to

administer the AAC for its effective period of five years in such a way as to avoid depleting the stock of trees identified as suitable for traditional purposes.

- *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. Under the Forest Practices Code, biodiversity in a given management unit is assessed and managed at the stand and landscape levels.

- *stand-level biodiversity*

Stand-level biodiversity is managed by retaining reserves of mature timber or wildlife tree patches within cutblocks to provide structural diversity and wildlife habitat. In considering stand-level biodiversity, the licensee performed a GIS-based spatial analysis to determine the area of the timber harvesting land base on which sufficient area was not already excluded for other objectives which could also function as wildlife tree patches. After accounting for areas that would have a sufficient amount and distribution of permanent standing forest, the licensee found that 1233 hectares of the timber harvesting land base required some further land base deduction, additional to all the other deductions already applied in the timber supply analysis, to account for wildlife tree patches.

MELP staff calculated that, in accordance with the Vancouver Forest Regional Manager's letter of December 15, 1997, to major licensees, 10 percent of the 1233 hectares, or 123 hectares, would need to be removed from the timber harvesting land base for wildlife tree patches, with a possible small increase in this figure to attain a representative distribution of tree species and ages.

This small reduction of 123 hectares or so to the timber harvesting land base will constrain the timber supply slightly throughout the forecast period, and I have taken this into consideration in my determination as discussed in "Reasons for Decision".

- *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. The *Biodiversity Guidebook* is based in part on the principle that this—together with connectivity of ecosystems and the maintenance of forested areas of sufficient size to maintain forest interior habitat conditions—will provide for the habitat needs of most forest and range organisms.

A major consideration in managing for biodiversity at the landscape level is leaving sufficient and reasonably located patches of old-growth forests for species dependent on, or 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 is needed to represent the different natural disturbance patterns under which ecosystems have evolved. Natural disturbance types (NDTs) vary from frequent wildfires in the dry interior regions to rare stand-initiating events (wind, fire, landslides) in the wetter coastal regions.

The delineation and formal designation of “landscape units” is a key component of a sub-regional biodiversity management strategy. Any of a range of biodiversity emphasis options may be employed when establishing biodiversity management objectives for a landscape unit. The *Biodiversity Guidebook* outlines three biodiversity emphasis options—lower, intermediate and higher. Each option is designed to provide a different level of natural biodiversity and a different risk to the maintenance of elements of natural biodiversity when finding an appropriate balance between biodiversity and timber supply in setting objectives for a landscape unit.

For areas where landscape units have not yet been formally established, or an emphasis option has not been assigned for a landscape unit, in accordance with the *Biodiversity Guidebook* the lower biodiversity emphasis option is to be used as a default to guide operations. In addition, in the absence of a plan, the policy currently incorporated into timber supply analysis—with the intention of balancing social and economic impacts against risk to biodiversity—is to model approximately 45 percent of the area in the lower, approximately 45 percent in the intermediate, and approximately 10 percent in the higher biodiversity emphasis options, consistent with the *Forest Practices Code Timber Supply Analysis* report.

The establishment of landscape units for TFL 38 has not been completed—the landscape units are in a draft stage—and the biodiversity requirements applied in the timber supply analysis base case were developed prior to the government policy direction identified above. In the base case, lower-emphasis biodiversity forest cover requirements were assumed for both the ‘mature and old’ and ‘old’ seral stage forests, for each NDT/biogeoclimatic zone/landscape unit combination.

The licensee states that with minor exceptions the forest cover requirements for intermediate emphasis biodiversity objectives could have been met throughout the TFL at base case harvest levels. However, Squamish Forest District staff are concerned that if biogeoclimatic subzones and variants had been used as a basis for the analysis, instead of the NDT/biogeoclimatic zone combinations, even the lower-emphasis cover requirements might not have been met in the more heavily harvested, valley-bottom areas. (The licensee advises that this procedure was not followed owing to inconsistencies between the 1:250 000 scale mapping and operational observations, such that until further mapping is complete, the detail at the subzone and variant level would be no more reliable than the methodology used.)

In considering these differing assessments, I have reviewed a sensitivity analysis in which intermediate-emphasis biodiversity requirements were applied to one of the draft

landscape units (unit 3) with no impact on the short-term timber supply—this is consistent with the licensee’s position for at least part of the TFL. I have also considered that in the base case analysis the requirements were applied to both the ‘mature and old’ and ‘old’ seral stages, while BCFS policy for the coast (detailed in an attachment to a December 1, 1997 memo from the Director, Timber Supply Branch) is to apply these cover requirements to the ‘old’ seral forests only. The requirements were also assumed to be applied in full immediately, which would be more highly constraining than application with the allowed phase-in period. These three factors together provide assurance that the initial harvest level in the base case projection can be achieved, with some additional flexibility to accommodate further constraints that may result from planning.

From this I have concluded as follows. The landscape unit boundaries and objectives for TFL 38 are yet to be formalized, and until this is complete the timber supply implications will remain somewhat uncertain. In the interim, the licensee has taken what I consider to be a reasonable approach to incorporating landscape-level biodiversity requirements in the analysis, although I emphasize that the draft landscape units and objectives as currently proposed may be subject to change, and that my assessment does not require, and is not contingent upon, acceptance of their present form. While I cannot predict the exact characteristics of the landscape units as they will eventually be defined, in my judgment I consider there to be only a relatively low risk that the outcome of the landscape unit planning process will be more constraining to timber supply than the somewhat restrictive assumptions already incorporated in the base case.

For this determination I therefore accept that the landscape-level biodiversity assumptions as modeled are reasonable and acceptable for use.

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

Twenty-year plan

The purpose of the 20-year plan is to show whether or not the volume projected for harvest in the base case over the next 20 years can be appropriately configured in specific areas on the landscape.

On December 16, 1997, the Squamish Forest District Manager conveyed his acceptance of the 20-year plan in a letter to the licensee. In the letter the district manager noted that initial concerns regarding goat winter range and other biodiversity issues had been satisfactorily addressed, and emphasized his expectation that marginal stands in the TFL will be harvested. He indicated his satisfaction that the plan is a reasonable representation of a 20-year harvest option for the TFL, and that the proposed AAC can be accommodated over the 20-year period.

The district manager’s acceptance of the 20-year plan for TFL 38 confirms his assessment that the harvest levels projected in the base case for the first two ten-year periods can be achieved in appropriate configurations on the landscape. From this I am satisfied that the

licensee's proposed initial harvest level will be spatially feasible for at least the first five years of the projection, which form the term of this AAC.

Strategic planning processes

The Lower Mainland Protected Areas Strategy (LMPAS), which includes the Squamish Forest District and TFL 38, has largely been completed, and new protected areas have been announced. The LMPAS process also recommended to government that Resource Management Zones should be established through a sub-regional planning process, but to date no such process has been approved. The Spotted Owl Management Plan approved by cabinet in April of 1997 does include Special Resource Management Zones, but only a small part of one of these zones (SRMZ 21, see above, *wildlife habitat*) overlaps TFL 38. Preliminary work has been undertaken on reviewing the requirements for further strategic land-use planning processes in the Squamish Forest District. If over the period of Management Plan No. 8 a land use process is initiated and completed, the outcome could lead to changes in the management zones as currently defined for TFL 38, and the results would be incorporated into future timber supply analyses and AAC determinations.

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

Alternative harvest flows

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

In addition to the base case harvest forecast, the licensee provided two alternative harvest forecasts applying the same land base, timber yield and management assumptions as those used in the base case. Each alternative commenced at 280 000 cubic metres per year—12 percent higher than the base case of 250 500 cubic metres per year. One held this level for one decade, then declined at 12 percent per decade, while the other held the initial level for two decades, then declined at 15 percent per decade. These two harvest flow projections—achieved under the same assumptions as in the base case, which declined at an average of less than ten percent per decade—show that there is flexibility in the timber supply projected in the base case to accommodate additional levels of uncertainty in specific factors, such as riparian reserves or wildlife tree patches for

example, within acceptable rates of decline. Thus the base case projection provides some opportunity to deal with additional risks and uncertainties that may arise and constrain the timber supply in the future. I have taken this flexibility into account in making my determination, as noted in “Reasons for Decision”.

The licensee also provided two forecasts in which composite sets of key assumptions in the base case were altered. In general the assumptions incorporated in these forecasts were reasonable combinations of factors that would work to increase and decrease the timber supply. The two analyses indicated significant potential timber supply benefits for the mid and long terms. Both projections provide helpful information which has contributed to my assessment of the risks and flexibility present in the timber supply over time. However, some of the assumptions used were not based on currently verified information, and in my AAC determination I have taken only very general guidance from these forecasts, and have placed less reliance on their results than on the forecasts which applied the same assumptions as in the base case.

Community dependence on the forest industry

The communities of Squamish and, to a lesser extent, Pemberton, Whistler, Britannia Beach and Lions Bay, are dependent on forest-based resources including TFL38. According to the licensee’s analysis, TFL 38 contributes an estimated one-third of the Squamish Forest District’s timber supply and provides a similar proportion of the area’s employment in forest management, including harvesting, road construction and silviculture, for an estimated 642 full time positions.

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

Timber processing facilities

The licensee owns and operates one manufacturing facility in the Squamish area, Squamish Lumber, which saws primarily Douglas-fir and employs 194 people. I am aware at the time of this writing that the licensee has recently announced a temporary closure of this facility. The mill’s annual capacity exceeds the amount of AAC currently available from TFL 38—the TFL’s AAC supplies 53 percent of the mill’s annual capacity, the full profile for which is achieved through two forest licences and trade agreements.

- (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;**

Minister's letter and memorandum

The Minister has expressed the economic and social objectives of the Crown for the province in two documents to the chief forester—a letter dated July 28, 1994, (attached as Appendix 3) and a memorandum dated February 26, 1996, (attached as Appendix 4).

This letter and memorandum are consistent with the objectives stated in the Forest Renewal Plan and include 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 community stability.

The Minister stated in his letter of July 28, 1994, that “any decreases in allowable cut at this time should be no larger than are necessary to avoid compromising long-run sustainability.” He placed particular emphasis on the importance of long-term community stability and the continued availability of good forest jobs. To this end he asked that the chief forester consider the potential impacts on timber supply of commercial thinning and harvesting in previously uneconomical areas. To encourage this the Minister suggested consideration of partitioned AACs.

I have reviewed the opportunities for commercial thinning, and, as discussed under *commercial thinning*, the licensee is not currently undertaking or planning to undertake commercial thinning on the TFL. I have also reviewed opportunities for harvesting in previously uneconomic areas, in respect of which I note that harvesting in marginally economic stands is already assumed in the base case projection.

The Minister's memorandum addressed the effects of visual resource management on timber supply. It asked that pre-Code constraints applied to timber supply in order to meet VQOs be re-examined when determining AACs in order to ensure they do not unreasonably restrict timber supply. I have discussed this above under “*Visually sensitive areas*,” where I noted that for TFL 38, recommended visual quality classes were developed in consideration of other objectives now required under the Forest Practices Code and considering the use of improved applications of landscape design techniques.

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. The licensee advises that it took a number of steps to provide opportunities for public review of information included in Management Plan No. 8, by:

- advertising in local newspapers the initiation of the Management Plan and the draft statement of management objectives, options and procedures (SMOOP);
- making the draft management plan available for public viewing, and
- notifying licenced users of TFL 38, adjacent landowners and other parties, in writing, of the preparation of Management Plan No. 8.

The most common public responses expressed the need for alternative silviculture techniques and the maintenance of biodiversity.

Where possible, I have attempted in this rationale to respond briefly to the views expressed, and consideration of this input has been an important component of this determination.

First Nations

First Nations' concerns on various issues are presented and addressed in the relevant sections throughout this document, particularly under "First Nations old growth and old-growth cedar requirements".

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

Unsalvaged losses

Unsalvaged losses are timber volumes destroyed or damaged by natural causes such as fire and disease but not recovered through salvage operations. In regenerated forests, a number of parasites, fungi or plants can kill trees or degrade the quality and value of logs.

Estimates for unsalvaged losses account for epidemic (abnormal) infestations and for factors that result in losses that are not recovered through salvage harvest programs but which are not recognized in yield estimates. Timber volume losses due to insects and diseases that normally affect stands (endemic losses) are accounted for in inventory sampling for existing timber yield estimation or through other methods. Losses associated with second-growth stands are addressed by application of operational adjustment factors (OAFs) as noted under *volume estimates for regenerated stands* and discussed under *decay, waste and breakage*.

In order to estimate non-recoverable losses on TFL 38 for insects and disease, estimates from the adjacent Soo Timber Supply Area were used and extrapolated to TFL 38. This resulted in an expected loss of 1320 cubic metres per year. For estimated losses due to fire, the same procedure was used, resulting in an expected loss of 2385 cubic metres per year. The combined estimated unsalvaged losses of 3705 cubic metres per year were accounted for in the timber supply analysis.

For the purposes of this determination, in the absence of better information I have accepted the licensee's derived estimate for unsalvaged losses. However, during the term of Management Plan No. 8, I expect the licensee to further review the estimate of unsalvaged losses directly for TFL 38, to reduce any uncertainty in this factor.

Reasons for Decision

In reaching my AAC determination for TFL 38, I have considered all of the factors presented above, and I have reasoned as follows.

The timber supply analysis base case projected an initial harvest level of 250 500 cubic metres per year, 4.8 percent below the current AAC of 263 000 cubic metres.

In determining AACs, my considerations typically identify factors which, considered separately, indicate that the timber supply may be either greater or less than that projected in the base case. Some of these factors can be quantified and their impacts assessed with some reliability. Others may influence timber supply by introducing an element of risk or uncertainty to the decision but cannot be reliably quantified at the time of determination. These latter factors are accounted for in determinations in more general terms.

The following factors have been identified as reasons why the timber supply projected in the base case may have been *overestimated* to a degree that may be quantified:

- **Low-productivity sites:** Given the very low productivity of site index 5 stands, I cannot support the inclusion of the 1342 hectares of these stands in the timber harvesting land base at this time. In view of the high proportion of the timber harvesting land base in low-productivity sites, I have assessed that there is considerable risk in including these stands, and I have assumed that the base case has overestimated the timber supply in regard to these stands by something less than 4 percent in the short, medium and long terms.
- **Stand level biodiversity:** The licensee and MELP found that 123 hectares of additional net-downs, plus a possible small increase for representativeness, will be required for wildlife tree patches; this will constrain the timber supply slightly throughout the forecast period.

The following factors have been identified as indicative of a potential overestimation of the timber supply to a degree that currently cannot be quantified with accuracy.

- **Economic and physical operability—the “831” and “931” stands:** The licensee has included 4878 hectares of hemlock, cedar and balsam “831” and “931” stands which District staff agree are accessible, but some of which may be in areas that are environmentally sensitive with respect to soil or terrain, or that may experience regeneration problems. Without further study it is not possible to quantitatively assess the risk this may pose to supply. I have recommended that this issue be studied, and in the meantime I have considered it reasonable to expect that there is a likelihood of at least some small degree of risk.

- Economic and physical operability—marginally economic stands: The licensee has attempted in the timber supply analysis to provide a realistic accounting for marginally economic stands. However, neither District staff nor the licensee has firm factual information reflecting current performance, and much remains unknown about the feasibility of harvesting the marginally economic stands as currently mapped. I am concerned that ongoing deferral of the harvest of these stands would introduce, over time, a growing risk of uncertainty to the timber supply, due to increasing dependence on stands of lower economic viability. Thus, while I acknowledge the licensee’s efforts to date in assessing these stands, more information is required to reduce this uncertainty, which to my mind at this time constitutes a small unquantified risk to the supply.
- Riparian habitat: The base case underestimates the land base reductions required for the management of riparian areas. This underestimation subject to some uncertainty but is of the order of about 0.5 percent of the timber harvesting land base.

In reviewing the above list of factors indicating overestimation of the timber supply in the base case projection, and in assessing the overall resultant timber supply implications, I have taken guidance from the alternative harvest forecasts provided by the licensee.

As noted under “Alternative Harvest Flows”, the licensee provided two alternative forecasts in which the same assumptions as in the base case were applied with respect to land base, timber yield and management, but in which the harvest levels were allowed to decline at 12 and 15 percent per decade respectively, instead of at the less-than-ten percent per decade average rate in the base case. In each case an initial harvest level 12 percent higher than in the base case was obtained. In the 15-percent decline, the initial harvest level was held for two decades. These analyses show that there is substantial flexibility in the timber supply to accommodate additional levels of constraint while achieving at least the initial harvest level attained in the base case and maintaining acceptable rates of decline.

As also noted under “Alternative Harvest Flows”, the licensee provided two harvest forecasts in which composite sets of key assumptions in the base case were altered. The two analyses indicated significant potential timber supply benefits for the mid and long terms under the defined options. I have noted earlier that while the combinations of assumptions in these forecasts were generally reasonable, some were not based on currently verified information, and for this reason I have not placed as much weight on their results as on the other forecasts using base case assumptions. Nevertheless, in considering these analyses I have noted that under the specific prescribed sets of conditions, the potential could exist for some increase in the timber supply in the mid and long terms.

From the list of constraining influences on the timber supply as set out above, it is evident that the timber supply in the TFL is subject to a number of uncertainties on various counts, most of which—at this time—are not sufficiently quantifiable as to permit a numerical determination of the size of a single net resultant overall influence on the timber supply.

However, I am satisfied that these considerations do provide sufficient information for a general assessment of the combined risk to the attainability of the initial harvest level in the base case projection, as follows.

The largest single constraining factor, the exclusion of the site index 5 stands from the timber harvesting land base, represents less than a four-percent reduction in the projected initial harvest level. The magnitude of this risk must be considered in context of the noted alternative harvest flow analyses showing the ability of the timber supply to support an initial harvest level 12 percent higher than in the base case, for one decade if a per-decadal decline rate of 12 percent is permitted instead of 10 percent as in the base case, or for two decades with a decline rate of 15 percent. Generally, in consideration of the size of associated social and economic adjustments, and in consideration of the social and economic objectives of the Crown as expressed by the Minister of Forests in his letter of July 28, 1994 (attached as Appendix 3), lower decline rates, where possible, are preferable. Decline rates of 10 and 12 percent are reasonably common in harvest flow transitions to long term levels in British Columbia, and are generally accepted in the public's review of the Province's Timber Supply Review program documents.

I am therefore prepared to accept that the potential to increase the decline rate for harvest levels in TFL 38—which, if implemented, would permit a 12-percent increase in the short-term harvest level—presents an acceptable means of eliminating a greater risk than the constraint imposed by excluding the site index 5 stands (which has less than a four-percent impact). In fact, while the other identified risks of constraint to the timber supply are not well quantified, they are nevertheless each identified as having only a small impact. In my judgement, based on experience in coastal units in this and the previous round of AAC reviews, and based on the land base sensitivity analysis noted in the following paragraph, the sum of these risks is unlikely to exceed the margin of additional risk that can be compensated for by implementing the alternative harvest flow as described.

My confidence in this assessment is founded in part on the licensee's sensitivity analysis showing that reducing the timber harvesting land base by 5 percent reduces the base case initial harvest level by just 5.7 percent. This is nearly a proportionate response, and in my judgement the combined impact of the identified constraining factors is unlikely to exceed either of these figures by any significant amount in the short term. Thus it is reasonable to expect that the combined impacts of all the identified additional constraints, as well as the less-than-four-percent impact from the removal of the site index five stands, could be more than accommodated within the additional 12 percent initial timber supply afforded by adjusting the subsequent harvest flow in the manner described.

In addition to the foregoing discussion of factors which affect the timber supply in the short term and therefore bear directly on this determination, it must be remembered that the following factors have also been identified as having the potential to influence the timber supply, primarily in the period beyond the duration of the AAC currently under determination:

- Genetically improved stock: I believe that in the future the use of genetically improved stock will produce average yield gains higher than those modelled in the

base case, with some consequent but presently unquantifiable enhancement of the timber supply.

- Identified wildlife: The management of identified wildlife species could eventually require some specific land base exclusions in addition to overlaps with existing exclusions, and could constrain the supply to some extent consistent with the established target of an average one percent impact for the province as a whole.
- Roads, trails and landings: Considering the steep and rugged terrain of TFL 38, and the results of sensitivity analysis, it is possible that the timber supply may be constrained by a small reduction of up to one percent in the mid term.
- Recreation: The proximity of the TFL to large populations, together with the creation of new park areas, is likely to result in recreational activity in the TFL. At the present time any associated impacts on timber supply cannot be estimated accurately, and I have considered this to represent an unquantifiable risk mainly to the mid and longer terms.

Since the timber supply impacts of these last four factors are uncertain and are not likely to occur until after the period of this AAC, in this determination I have made no adjustments on their account. Nevertheless I have considered their possible later impacts singly and in combination and have noted that at this time they do not appear to present any risk to the supply that cannot be managed in the mid term within anticipated rates of decline.

I have also noted that First Nations' cultural and archaeological values have the potential to affect timber supply to an uncertain degree. I am advised that historically there has been use by First Nations throughout the TFL, and it is reasonable to expect that further archaeological sites will be discovered through ongoing Archaeological Impact Assessments, with timber supply impacts associated with protecting areas around CMTs and other archaeological sites. At this time I do not have sufficient information to confirm or evaluate these potential impacts. However, as noted earlier, I expect the district manager to consider areas of cultural or archaeological significance, or of traditional use, in his administration of the AAC determined for TFL 38. Any detailed information gathered during archaeological impact assessments or traditional use studies may provide information that will help to guide operations on the TFL over the term of Management Plan No. 8. This will also permit more accurate assessment, in the next timber supply analysis, of the impacts that may be expected on timber supply from protecting cultural heritage resources. Since the timber supply analysis made no accounting for cultural heritage sites, if cultural heritage inventories are found to have a significant impact on timber supply, I am prepared to consider revisiting this determination at an earlier date than the five-year review required by the *Forest Act*.

From all the foregoing reasoning, I am satisfied that the initial harvest level of 250 500 cubic metres projected in the base case is adequately supported by the timber supply and that for the period of Management Plan No. 8, non-timber forest values ranging from cultural heritage resources (with the above-indicated proviso) to biodiversity can be accommodated in operational planning for the administration of an AAC determined consistent with this projected initial harvest level.

Determination

Having considered and reviewed all the factors as documented above, and taking into account the risks and uncertainty of the information provided, it is my determination that timber harvest levels that accommodate objectives for all forest resources during the next five years, that reflect the socio-economic objectives of the Crown for the area, that provide for longer-term integrated resource management objectives, and that reflect current management practices, can be best achieved in the TFL at this time by establishing an AAC of 250 500 cubic metres, effective August 6, 1998.

Implementation

This determination is effective August 6, 1998, and will remain in effect until a new AAC is determined, which must take place within five years of the effective date of this determination. In the period following this determination and leading to the subsequent determination I expect the licensee to carry out the following:

- gain a better understanding of the extent and distribution of any stands classified as “831/931” which are difficult to regenerate or are in environmentally sensitive areas, and ultimately clarify the management objectives for these stands;
- in cooperation with staff of BCFS and MELP, analyze the extent to which stand level biodiversity (wildlife tree patch) provisions including representativeness require further reductions to the timber harvesting land base for TFL 38;
- in cooperation with BCFS staff, examine procedures used to estimate non-recoverable losses so that the uncertainty affecting this factor may be reduced;
- complete further map-based analysis of water bodies in order to provide a better understanding of actual riparian requirements for TFL 38;
- clarify management objectives for deciduous stands and monitor the conversion of these stands; and
- gather more information on the economic viability of the land base.



Larry Pedersen
Chief Forester
August 6, 1998

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act* reads as follows:

Allowable annual cut

8. (1) The chief forester must determine an allowable annual cut before December 31, 1996, and after that determination 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 and woodlot licence areas, and
 - (b) each tree farm licence area.
- (2) If, after October 1, 1992, the minister
- (a) makes an order under section 7 (b) respecting a timber supply area, or
 - (b) amends or enters into a tree farm licence to accomplish the result set out under section 39 (1) (a) to (d),
- then, with respect to that timber supply area or tree farm licence area, as the case may be, the chief forester is not required to make the determination under subsection (1) of this section before December 31, 1996, or within 5 years after the last determination, but is required to make the determination
- (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 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).
- (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) or (2) 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 this section 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,
 - (b) different types of timber and terrain in different parts of private land within a tree farm licence area, and
 - (c) gains in timber production on Crown land that are attributable to silviculture treatments funded by the government of British Columbia, the federal government, or both.
- (6) The regional manager or district manager must determine a volume of timber to be harvested from each woodlot licence area during each year or other period of the term of the woodlot licence, according to the licence.
- (7) In determining an allowable annual cut under this section 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) silvicultural treatments to be applied to the area,
 - (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,
 - (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and
 - (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,
 - (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,
 - (c) the nature, production capabilities and timber requirements of established and proposed timber processing facilities,
 - (d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and
 - (e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

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

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

Purposes and functions of ministry

4. The purposes and functions of the ministry are, under the direction of the minister, to
 - (a) encourage maximum productivity of the forest and range resources in the Province;
 - (b) manage, protect and conserve the forest and range resources of the Crown, having regard to the immediate and long term economic and social benefits they may confer on the Province;
 - (c) plan the use of the forest and range resources of the Crown, 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, in consultation and cooperation with other ministries and agencies of the Crown and with the private sector;
 - (d) encourage a vigorous, efficient and world competitive timber processing industry in the Province;
and
 - (e) assert the financial interest of the Crown in its forest and range resources in a systematic and equitable manner.

Documents attached:

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



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



John Cuthbert

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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

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



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.

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Larry Pedersen
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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