

**BRITISH COLUMBIA  
MINISTRY OF FORESTS**

# **Tree Farm Licence 52**

Issued to West Fraser Mills Limited

## **Rationale for Allowable Annual Cut (AAC) Determination**

**effective December 1, 1996**

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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 considered and the rationale employed in making my determination, under section 7 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 52. The document will also identify where new or better information is required for incorporation into future AAC determinations.

## **Description of the Tree Farm Licence**

TFL 52, held by West Fraser Mills Ltd. (WFM), is situated in the Quesnel Forest District, and is located east of Quesnel and west of Bowron Lake Provincial Park. The total area of TFL 52 is about 261 000 hectares, with productive forest covering about 242 000 hectares, or 93 percent, of the TFL. The TFL is typified by rolling plateaus in the west and the Cariboo Mountains in the east. The TFL contains the headwaters of the Cottonwood, Bowron, and Willow Rivers, which all flow into the Fraser River. The forest cover is dominated by spruce and lodgepole pine.

The TFL consists primarily of two biogeoclimatic zones: the Sub-Boreal Spruce (SBS) zone located generally below 1200 metres elevation, and the Engelmann Spruce- Subalpine Fir (ESSF) zone located generally above that elevation. The Interior Cedar- Hemlock (ICH) zone covers a very small area near the eastern boundary of the TFL.

The volume of logs harvested annually from the TFL represents nearly one-half of the wood processed in the WFM sawmill in Quesnel. The sawmill has an annual capacity of 275 million board feet. A 3-year mill modernization is nearing completion but this will not change the mill's annual capacity.

## **History of AAC**

TFL 52, known also as the Bowron-Cottonwood TFL, was originally issued in January 1991 to WFM. The TFL was issued in exchange for WFM's forest licence holdings in the Prince George Forest Region and a portion of its forest licence in the Quesnel TSA. WFM still retains some AAC under a forest licence in the Quesnel TSA. The AAC for TFL 52 was initially set at 518 952 cubic metres in 1991 and this is the current AAC.

The AAC apportionment included 35 239 cubic metres for the Small Business Forest Enterprise Program (SBFEP) and 8500 cubic metres intended for woodlot licences. About 3000 cubic metres have currently been issued under the woodlot program, and the remaining apportionment of 5500 cubic metres has been harvested under the SBFEP.

## **New AAC Determination**

Effective December 1, 1996, the new AAC for TFL 52 will be 549 000 cubic metres, which represents about a 6 percent increase from the current AAC. The new AAC includes volumes harvested through the Small Business Forest Enterprise Program. The new AAC excludes issued woodlot licences. This new 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 52 includes the following:

- Statement of Management Objectives, Options and Procedures (SMOOP) submitted by WFM on November 17, 1993, and accepted by the BC Forest Service (BCFS) on July 27, 1994;
- Information Package submitted by WFM on June 19, 1995, and accepted by the BCFS on October 26, 1995;
- Timber Supply Analysis Report submitted by WFM on December 20, 1995, and accepted by the BCFS on April 15, 1996;
- MP No. 2 submitted by WFM on December 20, 1995;
- Twenty-year Plan submitted by WFM on June 22, 1995, revised on December 20, 1995, and accepted by the BCFS on April 2, 1996;
- *Quesnel Timber Supply Area Socio-Economic Analysis*, March 1995, by Economics and Trade Branch, BCFS;
- *The Cariboo-Chilcotin Land Use Plan (CCLUP)*, October 1994, by the Government of British Columbia;
- *The CCLUP 90-day Implementation Process Final Report*, February 1995, by the Government of British Columbia;
- *CCLUP Interim Interpretive Guide*, April 1996, by the Cariboo Chilcotin Regional Resource Board and the Cariboo Mid-Coast Interagency Management Committee;
- *CCLUP Integration Process*, September 1996, by the CCLUP Implementation Committee;
- Information package assembled by the BCFS for AAC Determination and MP No. 2 Approval meeting on April 18, 1996;
- Discussion with BCFS staff, including Quesnel Forest District and Cariboo Forest Region staff, at AAC Determination and MP No. 2 Approval meeting, April 18, 1996;
- Letter from the Minister of Forests to the Chief Forester, dated July 28, 1994, stating the Crown's economic and social objectives (Appendix 3);
- Memorandum from the Minister of Forests to the Chief Forester, dated February 26, 1996 stating the Crown's economic and social objectives regarding visual resources (Appendix 4);
- *Forest Practices Code of British Columbia Act*, July 1995;
- *Forest Practices Code of British Columbia Regulations*, April 1995;
- *Forest Practices Code Timber Supply Analysis*, BCFS and BC Environment, February 1996.

### **Role and Limitations of the Technical Information Used**

The *Forest Act* requires me 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 formed the major body of technical information used in my AAC determination for TFL 52. The timber supply analysis is 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 simplifications of the real world. There is uncertainty about many of the factors used as inputs to timber supply analysis due in part to variation 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 the complete solution to forest management problems such as AAC determination. 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 I must consider in AAC determinations.

In making the AAC determination for TFL 52, 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 7 of the *Forest Act* requires the Chief Forester to consider various factors in determining AACs for timber supply areas and tree farm licence areas. Section 7 is reproduced in full as Appendix 1.

## **Guiding Principles**

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. 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 up-to-date 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 7 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 impact of the Forest Practices Code on timber supply is a matter of considerable public concern. In determinations made before the Code was brought into force, no final standards or regulations were available at the time the timber supply analyses were conducted. Accordingly, the analyses were unable to assess the impacts of any new constraints on timber production which might be imposed under the Code. In those determinations I did not consider any more stringent restrictions or additional impacts upon timber supply beyond those anticipated to occur due to the application of guidelines current at the time of determination. However, I assumed that the Code would at least entrench the standards exemplified by those guidelines as statutory requirements.

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. Studies in selected TSAs (*Forest Practices Code Timber Supply Analysis*, BCFS and BC Environment, February 1996) indicate that under the Code there will be some impacts on timber supply additional to those expected under previous guidelines. In AAC determinations made since the coming into force of the Code, I have viewed with some caution the timber supply projections in timber supply analyses that pre-date the Code, or that are based on information packages that largely pre-date the Code, as is the case in TFL 52. At the same time, I am mindful that the full force of the Code may not be felt during the transition phase of its implementation, and the impacts of specific factors on timber supply may not yet have been assessed on a local basis.

The impact on the timber supply of land-use decisions resulting from planning processes such as the Commission on Resources and Environment (C.O.R.E.) process or the Land and Resource Management Planning (LRMP) process is a matter often raised in discussions of AAC determinations. In determining AACs it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from land-use decisions that have not yet been taken by government. Thus I do not consider the 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 land-use decisions, it may not always be possible to analyze the full timber supply impact in AAC determinations. In most cases, government's land-use decision must be followed by 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 is impossible to properly assess the overall impact of the land-use decision. Where specific protected areas have been designated by order in council, these areas are no longer considered to contribute to timber supply. The legislated requirement for five-year AAC reviews will ensure that future determinations address ongoing plan implementation decisions.

TFL 52 falls within the purview of a land use decision—the Cariboo-Chilcotin Land Use Plan (CCLUP)—that was made by the provincial government in October 1994 which identified resource zones and protected areas. The CCLUP implementation decisions were made by government in February 1995 through the *CCLUP 90-day Implementation Process Final Report* which identified resource targets and strategies for each resource zone. Moreover, certain provisions of the CCLUP, including zones, targets and strategies, were declared to be a higher level plan under the *Forest Practices Code of British Columbia Act*. I therefore view this declaration as a factor I must consider under section 7 of the *Forest Act*. Although not all aspects of the timber supply implications of CCLUP on TFL 52 are known with precision, I must consider the plan in my determination in order to ensure the harvest level does not compromise the attainability of CCLUP resource targets.

The Forest Renewal Plan will fund a number of intensive silviculture activities that have the potential to affect timber supply, particularly in the long term. In general, it is too early for me to assess the consequences of these activities, but wherever feasible I will take their effects into account. The next AAC determination will be better positioned to determine how the Plan may affect timber supply.

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 has created the extensive delays that have resulted in the current urgency to redetermine many outdated AACs. 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 interests 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 the June 1993 Delgamuukw decision of the B.C. Court of Appeal regarding aboriginal rights. The AAC I determine should not in any way be construed as limiting the Crown's obligation under the Delgamuukw decision, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within the TFL. It is also independent of any decision by the Minister of Forests with respect to subsequent allocation of the wood supply. Aboriginal rights will be taken into account as far as possible under Section 7(3) of the *Forest Act* and will be respected in the administration of the AAC determined.

Regarding future treaty decisions, as with other land-use decisions it would be inappropriate for me to attempt to speculate on the impacts on timber supply that will result from decisions that have not yet been taken by government.

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 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 Management Plan**

In accordance with section 28 of the *Forest Act*, holders of TFLs are required to submit a management plan (MP) every five years for the approval of the Chief Forester. This plan includes the proposed management objectives and strategies, in consideration of all resources, as well as inventories and analysis for specified resources on the area. In addition to the timber supply analysis, an operational timber supply projection and a twenty-year harvest plan are required, all of which are used by the Chief Forester for the determination of an AAC on the area.

As previously mentioned, in accordance with Section 7 of the *Forest Act*, the Chief Forester is required to determine an AAC for each TFL at least every five years. Given that the major components of the MP contain the key information that the Chief Forester requires for making an AAC determination, both the five-year MP approval and the AAC determination processes have been currently synchronized so that the Chief Forester simultaneously determines the AAC and approves the MP for a TFL.

Therefore, in this rationale for TFL 52, I will make reference to existing information in the proposed MP No. 2, and may also mention additional commitments or conditions that my approval of MP No. 2 will be subject to.

## **The Role of the Base Case**

In considering the factors required under Section 7 to be addressed in AAC determinations, I am assisted by timber supply forecasts provided to me through the work of the Timber Supply Review project for TSAs and, for TFLs, by the licensees.

For each AAC determination a timber supply analysis is carried out, using a data package of information from three categories: land base inventory, timber growth and yield, and

management practices. Using this set of data, and a computer simulation model, timber supply forecasts are produced. These include sensitivity analyses of changes in various assumptions around a baseline option, normally referred to as the "base case" forecast, which forms the basis for comparison when assessing the effects of uncertainty on timber supply.

The base case forecast represents only one of a number of theoretical forecasts, and 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 simulation 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 current information available about forest management, which—particularly during the period leading up to, and now during, the implementation of the Forest Practices Code—may well have changed since the original data package was assembled.

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. But once an AAC has been determined that reflects appropriate assessment of all the factors required to be considered, no additional precision or validation may be gained by attempting a computer analysis of the combined considerations to confirm the exact AAC determined—it would be impossible for any such analysis to fully incorporate the subtleties of the judgement involved.

For TFL 52, the timber supply analysis was conducted by Timberline Forest Inventory Consultants (Timberline) on behalf of the licensee by using a computer simulation model known as Continuous Area Simulation of Forest Management (CASH-FM version 5). Six management options reflecting different assumptions were modelled to determine potential timber harvest schedules. These were the Status Quo, Incremental Silviculture, Integrated Resource Management, Alternative Silviculture System, Improved Utilization, and MP No. 2 options. The Status Quo option reflects management that was current at the date of acceptance of the SMOOP, and therefore this option is used by Timberline as the base case. The base case indicates that an annual harvest of 599 000 cubic metres can be maintained throughout the 250-year simulation period. The base case represents a harvest increase relative to the current AAC. This increase was projected as a result of changes in management practices, and new and better information. All analysis options show an initial annual harvest of 599 000 cubic metres, which suggests that short term timber supply in this TFL is not highly sensitive to uncertainties or management changes.

### **Consideration of Factors as Required by Section 7 of the *Forest Act***

**The Forest Act, section 7 (3)**

**In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall consider**

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

Land base contributing to timber harvesting

The total area of the TFL 52 is about 261 000 hectares. About 19 000 hectares (7 percent) of the TFL consists of land classified as non-forest or non-productive forest, thus leaving about 242 000 hectares (93 percent) of the TFL in productive forest land. The land base contributing to timber harvesting over the long term as defined in the base case is about 82 percent of this productive forest land, or about 197 000 hectares. The base case excludes about 18 percent of the productive forest land as follows:

- about 7 percent (16 391 hectares) accounting for caribou habitat,
- about 3 percent (7633 hectares) accounting for low productivity sites,
- about 2 percent (5952 hectares) accounting for environmentally sensitive areas,
- about 2 percent (5758 hectares) accounting for roads, trails and landings,
- about 2 percent (4416 hectares) accounting for deciduous-leading stands,
- about 1 percent (2609 hectares) accounting for unmerchantable stands, and
- less than 1 percent (1438 hectares) accounting for other factors.

A number of the excluded types overlap, therefore Timberline's analysis reports both the gross area (or total area) classified under each factor as well as the net area deducted based on each individual factor alone. For example, a gross area of 9324 hectares of low productivity sites exist, but some of this area was deducted for other reasons like "environmental sensitivity," thus leaving a net reduced area of 7633 hectares based on the "low productivity sites" factor alone. The net area is shown above and in the discussion below there is further detail regarding each of these factors. The factors are listed here in the order of net area excluded and not in the order they were applied in the timber supply analysis. After examining each of the factors above, I discuss the lack of a specific deduction for inoperability.

*- caribou habitat*

The base case excludes a sizeable area located at high elevations for the purposes of maintaining caribou habitat. In total, 30 438 hectares of caribou habitat are excluded, but only 16 391 hectares are assigned to "caribou habitat" since other reduction factors that were previously applied had already excluded much of the area. When the current AAC was determined, a portion of this caribou habitat was essentially excluded through the use of non-recoverable losses, and another portion was placed in a planning deferral (based

on a Chief Forester letter dated November 23, 1989). The Cariboo-Chilcotin Land Use Plan (CCLUP) now supercedes this direction, but a caribou strategy that is intended to be approved by government as part of this plan is still under development. Therefore it remains uncertain at this time how this strategy might affect timber supply beyond that already analyzed.

CCLUP implementation has confirmed a deferral in the high elevation caribou habitat to December 31, 1999, which includes the same area excluded in the TFL under the base case, to allow further research to be completed. The CCLUP also indicates that 35 percent of the total deferral area will be available for modified harvest after the deferral period (i.e. starting in the year 2000). However, the TFL includes only a part of the deferred high elevation caribou habitat, and could end up with more or less than this 35 percent overall harvest target.

The licensee's interpretation of the CCLUP, based on the portion of the Quesnel Highlands Special Resource Development Zone (SRDZ) located in the TFL, suggests that nearly 9000 hectares of this deferred area may be available for timber harvesting under special guidelines for caribou management. Sensitivity analysis by Timberline indicates that including this area would increase the harvest forecast relative to the base case by 5 percent for the first 130 years. WFM's 20-year plan identifies 2791 hectares of this deferred caribou habitat area for harvesting.

While this shows the possibility that timber supply is higher than in the base case, it remains uncertain at this time how implementation of the objectives of the CCLUP (including the attainment of timber targets) will be reconciled over the entire SRDZ and how the caribou strategy might affect the TFL. Nevertheless, having examined this issue in detail, it is clear to me that the total exclusion of high elevation caribou habitat in the base case provides ample opportunity to meet the objectives of CCLUP for caribou. I accept the licensee's base case assumptions, which exclude the high elevation caribou habitat, as a reasonable approximation of the implications of caribou management at this time and therefore I consider the assumptions acceptable for this determination.

*- low productivity sites*

A net area of 7633 hectares of low productivity sites is excluded from the productive land base. These sites are defined as stands currently over 35 years of age whose site index (see *site productivity estimates*) is not sufficient to meet the minimum volume requirements of 120 cubic metres per hectare of coniferous volume at 150 years of age. For example, minimum site indexes of 7 metres and 8.5 metres (at 50 years) are required for spruce and pine stands, respectively, in order to meet these minimum volume requirements. A review of WFM's inventory indicated that if the minimum volume requirements were reduced to 100 cubic metres per hectare or increased to 140 cubic metres per hectare then the timber harvesting land base would increase (2378 hectares) or decrease (2672 hectares) by about 1 percent. WFM provided a cutting permit summary of

some stands which suggest that the minimum volume requirements assumed in the base case are reasonable. The minimum volume requirements also appear appropriate to district staff. I therefore accept the base case assumptions for this factor as suitable for the purposes of this determination.

*- environmentally sensitive areas*

The environmentally sensitive area (ESA) classification was completed during a 1978 BCFS survey. For the base case, reductions of 90 percent to highly sensitive (unstable) soils (Es1) and regeneration areas (Ep1), and 50 percent to moderately sensitive soils (Es2) and regeneration areas (Ep2) were applied. No reductions were applied for wildlife and recreation ESAs (Ew and Er) as it was assumed that other netdowns and the forest cover guidelines for wildlife and visual quality adequately protect these resources for the purposes of timber supply analysis.

Of the 11 743 hectares of ESAs in the TFL, 5952 hectares were specifically deducted from the land base due to the ESA factor. I note, however, that other netdown factors also overlapped with ESAs, resulting in only 1370 hectares of all ESAs (about 12 percent) actually contributing to the timber harvesting land base under the base case assumptions. I accept the method used in the Timberline analysis as reasonable and reflective of current management, and, therefore, as appropriate for this determination.

*- roads, trails and landings*

To account for existing and future roads, trails and landings, the Timberline analysis adopted a similar method to that used in the Quesnel TSA. In its analysis, Timberline defined the timber harvesting land base by deducting 4517 hectares for existing roads, trails and landings and 1241 hectares for future roads, trails and landings. I accept that Timberline's analysis employed the best available information, but recognize that there is some uncertainty in this factor since it is not based on studies within the TFL itself. Although uncertainty in this factor does not introduce a great deal of risk to short term timber supply, a study should be conducted for the TFL in order to better quantify this factor before the next timber supply analysis.

*- deciduous stands*

In the base case, predominantly deciduous stands (defined here as broad-leafed species) younger than 35 years of age, and older deciduous stands that were not projected to produce 120 cubic metres per hectare of coniferous volume by 150 years of age were excluded. This factor led to a net reduction of 4416 hectares of deciduous stands from the productive land base, most of which is aspen (3776 hectares).

These assumptions have been reviewed and WFM's MP No. 2 now commits to harvesting about 15 100 cubic metres per year of aspen; however, some of this harvesting may occur in predominantly coniferous or mixed stands. District staff report that WFM's 20-year plan identifies five cutblocks in aspen stands. MP No. 2 indicates that WFM's mill consumed, on average, about 30 000 cubic metres of aspen over the last seven years. Therefore, although the base case has excluded most predominantly deciduous stands, there is a good indication that WFM will be harvesting and using some aspen stands.

Sensitivity analysis showed that adding most of the aspen stands (3674 hectares) excluded in the base case resulted in a 3400 cubic metres per year (0.5 percent) increase to the long term harvest level. In reviewing the inclusion of these stands, I find there is a need to develop management objectives for aspen stands, as they provide a number of non-timber benefits. I have specified this need in my approval of WFM's MP No. 2. Therefore, the inclusion of some additional aspen stands, for which environmental concerns are addressed, constitutes only a minor upward pressure on the base case, which I acknowledge in my "Reasons for Decision".

*- unmerchantable stands*

Some stands which meet the minimum site index requirements, discussed previously in *low productivity sites*, may not meet the minimum volume requirements of 120 cubic metres per hectare at 150 years of age due primarily to low stocking levels. A net area of 2609 hectares for these unmerchantable stands was excluded from the productive land base due to this factor. MP No. 2 states that these types will likely not be harvested. I consider the method used for this factor reasonable for this determination.

*- other factors*

In the base case, the definition of the timber harvesting land base involved exclusions of 969 hectares of non-commercial brush, 461 hectares for riparian areas (see also *riparian habitats*), and 8 hectares with a preservation visual quality objective (not previously removed due to other factors).

*- inoperability*

In the Timberline analysis, no additional area was deducted due to economic and physical inoperability. Analyses for most timber supply units in the province include a reduction of a portion of the land base due to inoperability. I therefore discussed this matter with district staff, and they have indicated that any inoperable areas in the TFL likely occur in areas already considered unavailable for harvesting due to the previously mentioned factors (e.g. areas excluded for caribou habitat and sensitive soils). I note that a very similar situation with respect to inoperability also occurred in the BCFS analysis for the adjacent Quesnel TSA. In that unit as well, there was almost a complete overlap of potential inoperability with other factors that resulted in land base deductions. I am

therefore satisfied that the absence of a specific deduction for inoperability is reasonable for the purposes of this determination.

#### Existing forest inventory

TFL 52 consists mostly of stands dominated by spruce (about 50 percent) and lodgepole pine (about 40 percent). Also present are subalpine fir (also known as balsam), Douglas-fir, and deciduous (mainly aspen) stands. About 46 percent of the TFL's stands are over 120 years of age, while 26 percent are less than 41 years of age.

##### *- age of inventory*

The Timberline analysis used the existing inventory—which is based on surveys done in 1967-69 for about two-thirds of the TFL— along with a more recent reinventory conducted in 1988 for about one-third of the TFL. Inventory updates for growth and depletion to 1994 were used in the base case. In MP No. 2, WFM commits to completing a reinventory of forest cover for the TFL. Given the age of the existing inventory for most of the TFL, and the inability of inventory updates to capture fully the changes in forest composition over time, a reinventory is needed before the next determination, and I have so specified in my approval of MP No. 2.

##### *- volume estimates for existing stands*

In the Timberline analysis, existing volumes were estimated using the Variable Density Yield Prediction (VDYP) model for all stands greater than 20 years of age (for younger stands, see *volume estimates for regenerated stands*). This BCFS Resource Inventory Branch model projects yields using extensive sample plot information from around the province. The volume estimates for existing stands used by Timberline were accepted by the Resource Inventory Branch in a letter dated September 22, 1995.

An inventory audit was conducted in the TFL in 1995, and preliminary results indicate that there is no significant difference between average volumes estimated using field measurements and those estimated using the inventory map labels and VDYP. I therefore accept the volume estimates used in the Timberline analysis as the best available information for this factor. The audit notes, however, that there are map attribute discrepancies; this finding further supports the need for a reinventory in the TFL (as discussed in *age of inventory*).

#### Expected rate of growth

##### *- site productivity estimates*

Site index, determined from inventory data on stand height and age, is used as an estimate of site productivity. Timberline used accepted BCFS procedures in their site index

assignments for the analysis; for example, for stands over 35 years of age, site index was based on their existing height and age.

I am, however, aware that site indexes determined from both young stands (less than 35 years) and old stands (over 150 years) may not accurately reflect potential site productivity. In particular, findings in other areas of BC show that data from old stands may result in underestimation of site productivity. A provincial paired-plot survey is examining this issue and is expected to provide statistically sound information to help assess site indexes that should be available in time to assist the next timber supply analysis.

WFM's MP No. 2 notes the strong possibility that the site productivity of managed stands is underestimated and commits to evaluating the existing growth and yield program on the TFL, including the establishment of permanent sample plots.

In the meantime, I note that if site indexes have been underestimated in old stands, this can affect projections of the time required to reach green-up condition, the volumes in regenerated stands, and minimum harvestable ages. However, there would be no effect on the volume estimates for existing stands. The possibility that the site indexes have been underestimated for some sites that currently carry old stands suggests that medium and long term timber supply may be higher than indicated in the base case. However, sensitivity analysis conducted by Timberline shows that even if site indexes have been underestimated, there would be no effect on the initial harvest level projected in the base case. Future timber supply analyses will take into account new information on site indexes including results of the paired-plot study. Even though there is uncertainty about site productivity, given its minimal implications on short term timber supply in this TFL, I accept the base case assumptions for this factor for the purposes of this determination. If better information is developed, it will be considered in a future determination.

*- volume estimates for regenerated stands*

The Timberline analysis assumed that most stands less than 21 years of age and all future regenerated stands are managed stands. It estimated managed stand volumes using the BCFS Table Interpolation Program for Stand Yields (TIPSY), and this approach was accepted by the BCFS Research Branch. Volume predictions using TIPSY are based on management of stocking through planting, and are based on full site occupancy and absence of significant brush competition.

TIPSY projections are initially based on ideal conditions of full site occupancy and absence of pests and diseases. Operational Adjustment Factors (OAFs) are therefore applied to account for a loss of timber volume due to such factors as openings in stands that reflect unproductive areas like small swamps and rock outcrops (OAF1), as well as age-dependent factors such as pests, disease, decay, waste and breakage (OAF2). The Timberline analysis generally used the standard OAFs of 15 and 5 percent, respectively, although there are minor logical exceptions. The OAFs assumed in the base case reflect a



common approach used elsewhere in the province, and I therefore accept them for use in this determination. Although I recognize these factors are rough estimates in the absence of refined information, sensitivity analysis done by Timberline shows that some uncertainty about regenerated stand volumes does not affect short term timber supply.

*- minimum harvestable ages*

Minimum harvestable age is the time it takes for stands to grow to a harvestable condition. For the base case, it was assumed that stands are eligible for harvest when they are near to culmination age; for the purposes of the analysis, this is assumed to be the youngest age when Mean Annual Increment (MAI) increases by less than 0.05 cubic metres per hectare per year. Minimum harvestable age varies depending on leading species, site class and stand age. For example, lodgepole pine stands between 21 and 150 years of age on good sites are assumed to have a minimum harvestable age of 70 years, while older (>150 years) pine stands on poor sites are assumed to have a minimum harvestable age of 100 years. I am satisfied that the approach taken in the Timberline analysis is reasonable for the purposes of this determination.

**(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 an area is initially restocked with a specified minimum number of acceptable well-spaced seedlings. The Timberline analysis assumes an average regeneration delay of 2 years, and MP No. 2 indicates that this has been achieved in the TFL. District staff confirm that the licensee has rapidly reforested harvested areas in order to minimize regeneration delay. For the purposes of this determination, I am satisfied that regeneration delay has been suitably represented in the base case.

District staff indicate that spruce leader weevil is becoming a concern in plantations. They also note that brushing and weeding of some sites in order to achieve regeneration requirements may be detrimental to understory spruce seedlings since overstory brush seems to reduce the occurrence of the spruce leader weevil. To address this, there is a need to better identify the areas at risk, provide plans for the treatment of these areas, and assess impacts on timber supply. I have noted these requirements in my approval of MP No. 2. This issue does not significantly impact short term timber supply, but does represent an unquantified downward pressure in the long term that I have noted in my "Reasons for Decision."

Not-satisfactorily-restocked area

The Timberline analysis assumed 10 372 hectares of not-satisfactorily-restocked area (NSR) based on the inventory file. About 70 percent (7294 hectares) of this NSR is considered backlog as the areas were harvested prior to 1987. WFM's silviculture records indicate, however, that 78 percent (5709 hectares) of this backlog NSR has in fact been restocked. A portion of this area may be available for harvest sooner than modelled in the base case in the long term. I recognize that short term timber supply is not affected by the changes in this factor, and the implications of this difference are relatively minor in the long term as well.

**(iii) silvicultural treatments to be applied to the area;**Silvicultural treatments

Clearcutting is the silvicultural system practiced on the majority of the TFL, and this is assumed in the base case. There is a trend, however, towards partial cutting in visually sensitive areas, and WFM would like to employ partial cutting systems in some of the deferred caribou zone (see *caribou habitat*). The 20-year plan indicates that about 88 percent of the area to be harvested will be clearcut, while 12 percent will be partially cut. The plan states that 40 percent of the stand volume will be removed during the first partial cut in visually sensitive areas, and about 30 percent in the caribou zone.

Although WFM's plan suggests that downward pressures on short term timber supply can be offset by the use of partial cutting, further guidance on implementation of the CCLUP is still needed, for example, to determine to what extent harvesting will be permitted in caribou habitat. Therefore I have made no further allowances for the potential timber supply implications of partial cutting in my determination.

For the four-year period from 1991-94, MP No. 2 indicates an average of 830 hectares per year received stand tending treatments consisting primarily of chemical and manual brush control. MP No. 2 indicates funding through Forest Renewal BC (FRBC) has been provided for 1995 to prune or fertilize 253 hectares, and proposes to steadily increase treatments such that 1547 hectares would be treated in 1999. WFM has no plans at this time for any significant use of commercial thinning.

MP No. 2 indicates that WFM is a partner in the Vernon Seed Orchard and commits to planting genetically improved spruce seedlings beginning in 1996 and planting improved pine and fir seedlings in 2000. Given WFM's interest in the seed orchard and the MP No. 2 commitment, I find it reasonable to expect that this will occur.

It is likely, therefore, that timber supply could be increased due to the use of genetically improved stock and fertilization, as these activities were not assumed in the base case. I have noted this in my "Reasons for Decision" as an unquantified upward pressure.

**(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 used in the licensee's analysis are consistent with BCFS Interior utilization standards—minimum diameter at breast height of 12.5 centimetres for pine and 17.5 centimetres for other species, maximum stump height of 30 centimetres, and minimum top diameter of 10 centimetres. These utilization standards were used with VDYP and TIPSY to estimate existing and regenerated stand volumes. BCFS district staff confirm this level of utilization is being practised on the TFL.

WFM presented three harvest forecasts based on closer utilization than assumed in the base case, and they indicate timber supply would increase. However, this is not being currently practised, and, with the implementation of the Code, any potential for increased levels of utilization may be balanced by biodiversity considerations such as the retention of coarse woody debris. I therefore accept the base case assumptions for the purposes of this determinations.

Decay, waste and breakage

The VDYP model used to project existing stand volumes incorporates estimates of the volume of wood within a stand lost to decay, waste or breakage. These estimates have been developed based on field samples for different areas of the province. The decay, waste and breakage factors from the Cottonwood Public Sustained Yield Unit (DW2B), which includes TFL 52, were used in the Timberline analysis when using VDYP. For regenerated stands, as previously discussed, the standard 5 percent reduction using OAF 2 accounts for decay, waste and breakage (DW2B). At this time, these figures constitute the most complete and rigorous estimates available. I am not aware of any information that would render these estimates unreasonable for use in this determination.

**(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 purpose and function of the Ministry of Forests as provided in the *Ministry of Forests Act* (see Appendix 2) is to manage, protect and conserve the forest and range resources of the Crown and to plan the use of these resources to ensure production and harvesting of timber 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 affect the timber supply must be considered in AAC determinations.

In order to maintain forest resource values such as wildlife habitat and visual quality, forest cover objectives are developed that prescribe the maximum area that can be disturbed. Forest cover objectives ensure that harvesting and related activities do not become overly concentrated by specifying the "green-up" stand conditions that must exist on a reforested site before timber on adjacent areas may be harvested. Objectives for TFL 52 also include requirements to maintain older forests by specifying the minimum area needed in older-aged forests. Forest cover objectives provide for a distribution of harvested areas and retained forest cover across the landscape in keeping with overall management objectives for an area.

In TFL 52, the timber supply analysis represented the different objectives for, and management of, specific forest resources in the TFL, such as wildlife habitat and visual quality. These are discussed under the relevant sections below.

In the base case, the majority of the TFL's timber harvesting land base (about 84 percent) is subject to forest cover objectives for general IRM. In the base case, the IRM zone includes large and small riparian management zones (about 4 percent) and Forest Ecosystem Networks (3 percent) since the management of these areas is treated similarly to the general IRM zone. The riparian and Forest Ecosystem Network (FEN) zones were modelled differently in some other management options. For the base case, general IRM involved a three-pass harvesting system whereby no more than 33 percent of the area may be under the cover of stands that are shorter than 3 metres in height (i.e. green-up height) at any time. Average green-up ages to reach that height range from 12 to 20 years depending on the site. The 3 metre green-up height is the current standard under the Code and is therefore an appropriate base case assumption for general IRM. General IRM prescriptions also include a requirement that at least 10 percent of the total forest area be covered by stands 120 years of age or older at any time.

The sensitivity analysis assessed the impact of applying a four-pass harvesting system to the TFL (maximum of 25 percent younger than green-up age at any time) and found that there were no implications for short term timber supply and very minimal reductions in the medium and long term.

The Timberline analysis reflects current management requirements and the sensitivity analysis above indicates that timber supply is relatively stable even if management assumptions change. I accept the base case as a suitable representation of general IRM for this determination.

As discussed under "Guiding Principles", TFL 52 falls within a regional land use plan which has been approved by government. The plan establishes resource zones and resource targets which are discussed below and later in this rationale under a section entitled *Cariboo-Chilcotin Land Use Plan*.

- *biodiversity*

Biodiversity, or biological diversity, is 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. Current implementation of the Code calls for immediate consideration of stand level biodiversity and consideration of landscape level biodiversity once objectives are established.

Stand level biodiversity, which involves wildlife tree patch retention, was not modelled in the base case. The *Forest Practices Code Timber Supply Analysis* report indicates the short term provincial harvest impacts of stand level biodiversity to be about 3 percent in the absence of landscape level biodiversity objectives. However, the report also shows that there are no short term timber supply impacts in the Quesnel TSA since the existing inventory of mature timber in that TSA is very large—a situation very similar to the one in TFL 52. Nonetheless, provisions for stand level biodiversity under the Code will most likely exert a small downward pressure on the volume of harvestable timber which will have timber supply implications, at least in the medium and long term, and this is reflected in my "Reasons for Decision."

Landscape level biodiversity objectives include provisions to retain mature and old growth forests and, where appropriate, to establish FENs. These objectives have not yet been established in TFL 52, however provisions in the base case to retain at least 10 percent of the forest in stands with ages over 120 years at any time will no doubt at least partially account for these objectives. In the base case, productive forests that did not contribute to the timber harvesting land base were allowed to contribute to this old forest retention requirement.

The Forest Practices Code Higher Level Plan order has clarified that the Cariboo-Chilcotin Land Use Plan (CCLUP) seral stage targets will be based on the Code *Biodiversity Guidebook* ranges. Seral stage targets associated with each biodiversity emphasis option that are likely to have the greatest impact on timber supply are those for "mature and old" forests. Although the objectives for the TFL have not been finalized, I must account for the risk that this uncertainty introduces into this decision.

The biodiversity strategy being developed for the Cariboo-Chilcotin region assumes the region should meet the guidebook provincial average of 45 percent low, 45 percent intermediate, and 10 percent high biodiversity emphasis. About two-thirds of TFL 52 is in Enhanced Resource Development Zones, whereas about 40 percent of the region is in this zone, therefore the regional biodiversity emphasis options, if applied proportionally to the TFL, would likely overestimate timber supply impacts based on this zonal consideration. On the other hand, a recent draft product by the CCLUP biodiversity strategy committee suggests biodiversity emphasis options of about 35 percent low, 40 percent intermediate, and 25 percent high for the TFL. This draft, although not approved, suggests a proportionate assessment of emphasis options may underestimate timber supply impacts. For this determination, until biodiversity emphasis options are approved for the TFL,

I assume (in the absence of more specific information) the same biodiversity emphasis mix will apply to the TFL as to the region as a whole. While I am not advocating that the planning should necessarily be constrained by my assumption, this approach will provide a reasonable accounting of timber supply impacts due to landscape level biodiversity in the absence of any other specific or clear direction.

Sensitivity analysis indicates that the TFL is sensitive to changes in old forest retention requirements. For example, if 20 percent or 30 percent of the productive forests older than 120 years in the TFL were retained to meet biodiversity objectives, this would result in a 12 percent or 25 percent reduction, respectively, in the initial harvest levels projected in the base case. However, it is important to recognize that this sensitivity analysis was applied individually to each operating area and management zone combination within the TFL, as opposed to the TFL

as a whole. While this ensures a distribution of old forest across the TFL, the technique used results in more old forest being retained at the TFL level than necessary to achieve a 20 or 30 percent old forest requirement. For example, the deferred caribou habitat was modelled as its own management zone, and did not contribute to the retention of old forest in other management zones or operating areas. Therefore, the timber supply impacts which were shown in the Timberline sensitivity analysis overstate the impact of old forest retention at the TFL level. The actual timber supply implications will depend on how old forest retention requirements are applied (i.e. scale and biodiversity emphasis) to meet landscape level biodiversity objectives.

For each biodiversity emphasis option, "mature and old" forest cover targets are provided in the guidebook for Natural Disturbance Types (NDT) and biogeoclimatic zones. For example, using the guidebook, the "mature and old" forest cover target is to sustain more than 11 percent older than 100 years in the Sub-Boreal Spruce zone within NDT 3 for the low emphasis option and more than 36 percent older than 120 years in the Engelmann Spruce - Subalpine Fir zone within NDT 1 for the intermediate emphasis option.

If the regional biodiversity emphasis targets apply proportionally to the TFL as I have assumed to guide me in my accounting for this factor, then they would be 45 percent low, 45 percent intermediate, and 10 percent high. Based on a review of the distribution of NDTs and biogeoclimatic zones in the TFL, BCFS staff indicate the average "mature and old" forest retention target, using the biodiversity guidebook, would be about 23 percent at the TFL level. Productive forest which does not contribute to timber harvesting but is available for meeting biodiversity objectives equals about 17 percent at the TFL level. Their assessment also notes, however, that for NDT 1, the average requirement of about 30 percent for "mature and old" forest retention can likely be achieved given that about 30 percent of NDT 1 productive forest is not contributing to the timber harvesting land base due to reductions for management issues such as caribou habitat. This assessment applies to about 35 percent of the TFL. For the remaining 65 percent of the TFL in NDT 3, "mature and old" forest retention is about 19 percent. A total of about 3 percent of the productive forest may be assumed to contribute to this target by virtue of not contributing to the timber harvesting land base. Therefore, an NDT

3 average of about 16 percent "mature and old" forest would be necessary to maintain this target. However, forest cover guidelines applied to NDT 3 under the base case, and additional allowances made in my determination such as for riparian zones, will contribute to "mature and old" forest retention targets.

WFM analysis indicates that, after the 20-year plan is completed, which is based on a higher level of timber harvesting than assumed under the base case, the "mature and old" forest in the Quesnel Highland Special Resource Development Zone would be about 58 percent, with 47 percent in the Cottonwood Enhanced Resource Development Zone, and 45 percent in the Quesnel Enhanced Resource Development Zone. This is well above the proportional target of 23 percent that

I have assumed to guide me in my determination as I account for this factor. This also indicates flexibility over time to address landscape level biodiversity and older forest retention requirements within the TFL given its relatively large supply of mature and older forests.

Given the proportional "mature and old" target of 23 percent for the TFL, and keeping in mind both the NDT 1 and NDT 3 "mature and old" forest retention targets, I have taken note of the 20 percent, rather than the 30 percent, old forest retention sensitivity analysis to account for the risk and uncertainty with respect to maintaining flexibility for planning landscape level biodiversity rather than the base case. I acknowledge also that the sensitivity analysis overstates the direct timber supply impact of a 20 percent old forest retention requirement at the TFL level and I have accounted for this in my "Reasons for Decision."

- *wildlife habitats*

The TFL provides habitat for a variety of large and small mammals, birds, fish and other species. Guidelines for biodiversity and riparian habitats are intended to maintain habitat needs for most wildlife species. Special habitat guidelines have been developed for some individual wildlife species and these are discussed here. The base case accounts for caribou habitat by excluding the deferred high elevation area as noted under *caribou habitat*.

A very small area in the western portion of the TFL, representing 0.1 percent of the timber harvesting land base, contains important mule deer wintering habitat where special forest cover prescriptions were reflected in the base case. For this area, relative to the general IRM zone, the allowable disturbance was reduced from 33 to 25 percent, old forest (>120 years) retention was increased from 10 to 25 percent, and a provision for thermal cover was added such that 50 percent of the forest would be 60 years or older. I accept that the base case has suitably represented current management for wildlife habitat for the purposes of this determination.

- *riparian habitats*

Riparian habitats occur around streams, lakes and wetlands (swamps). The Code requires the establishment of riparian reserves that exclude timber harvesting and riparian management zones that restrict timber harvesting. The Timberline analysis identified a 10-metre reserve width along Class A (fish-bearing) streams that totalled 888 hectares, which reduced the timber harvesting land base (after other reduction factors were applied) by a net area of 461 hectares, or 0.2 percent. This analysis, however, was initiated prior to the Code and does not meet current Code requirements.

Recognizing that the base case does not reflect current Code requirements, WFM assessed the impact of applying Code riparian guidelines for streams and lakeshores (but not swamps) on the TFL using the assumptions developed for the Quesnel TSA in the *Forest Practices Code Timber Supply Analysis* as a template. WFM estimated there are 1510 hectares of riparian reserves (1354 hectares for streams and 156 hectares for lakeshores) and 6330 hectares of management zones (5804 hectares for streams and 526 hectares for lakeshores), with 1170 hectares and 4934 hectares respectively considered to be productive forest land. The combined productive forest area in reserves and management zones is 6104 hectares, or about 2.5 percent of the timber harvesting land base. Since some harvesting is permitted in riparian management zones, the impact on timber supply will be somewhat less than 2.5 percent. In addition, as discussed, the base case has already made some allowances for riparian habitat.

Therefore, in my "Reasons for Decision", I acknowledge that Code requirements for riparian management place a downward pressure relative to the base case management assumptions and recognize that this represents about a 1 to 2 percent reduction in short to long term timber supply.

- *watershed hydrology*

Watershed assessment procedures (WAPs) have been developed as a tool to help forest managers understand the type and extent of current water-related issues that exist in a watershed and to recognize the possible hydrologic implications of proposed forestry-related development. Using funding provided by FRBC, Level 1 assessments based on the *Interior Watershed Assessment Procedure Guidebook* are completed or underway for about 23 percent of the TFL area. The Timberline analysis made no special allowances for watershed hydrology concerns since assessments were not completed when preparation of MP No. 2 and corresponding analysis were initiated.

BC Environment has expressed concern about watershed hydrology in the TFL and the CCLUP integration process (see *Cariboo-Chilcotin Land Use Plan*), through a fisheries target review committee, has identified the Cottonwood watershed as having a high risk of not meeting cumulative hydrologic targets of the CCLUP. WFM's MP No. 2 recognizes that the rate of cut is a hydrologic concern on all of the major watersheds. WFM believes that flexibility in their



20-year plan in the short term can absorb any modification in harvest scheduling suggested by these assessments. In reviewing their plan (see *twenty-year plan*), I note that the plan does project more than 20 years of available volume at a harvest level 11 percent above the base case. It is reasonable to conclude that this 'surplus' introduces some flexibility in varying the plan to meet other objectives (such as hydrologic constraints if they are proven out) while providing a reasonable chance of still meeting projected harvest levels under the base case.

I acknowledge the concerns about watershed management and the licensee's commitments in MP No. 2. I have reviewed WFM's work for the TFL that suggests the watershed hydrology conditions under their 20-year plan are reasonable in the TFL portion of watersheds, but it remains unclear for the TFL relative to the balance of the watershed and what that might ultimately mean. Further watershed assessments are underway, and for the purposes of this decision, I am assuming that the results of the assessments can be implemented operationally without placing timber supply at risk (given the TFL's stable timber supply and the flexibility in the 20-year plan) in the short term. Therefore, no further allowances are known to be required at this time regarding this factor. Before the next determination, I expect Level 1 assessments to be completed and WFM should incorporate findings of these watershed assessments into the next MP and supporting timber supply analysis.

*- visual quality*

The visual landscape inventory undertaken by the licensee was reviewed by BCFS regional staff and found to be thorough and comprehensive. Using this inventory, the base case recognized visual quality objective (VQO) zones that represent 15 percent of the timber harvesting land base. The relatively large area in VQO zones in this TFL is due primarily to its proximity to the Barkerville corridor and to Bowron Park, and this appears to be consistent with the CCLUP direction. In the VQO zones, special management prescriptions were modelled that provided for a range of allowable disturbance depending on the VQO class (retention, partial retention, and modification) and the visual absorption capability (the ability of an area to absorb visual change) of the unit. As in the general IRM zone, a 3-metre green-up height was assumed for disturbed areas.

Sensitivity analysis modelled a 10 percent change in allowable disturbance in VQO zones. Allowing 10 percent more disturbance enabled short and medium term harvest level to increase 5 percent, while allowing 10 percent less disturbance still maintained initial base case harvest levels for the next three decades (medium term harvest level, however, was reduced by 7 percent). Given that short term timber supply is sensitive to a relaxation in allowable disturbance, the use of partial cutting in the VQO zones could be used to buffer downward impacts on timber supply. However, demonstrated performance is needed before this potential effect can reasonably be factored into AAC determinations. For this determination, I am satisfied that visual quality has been adequately modelled

and any clarification forthcoming on this matter through implementation of the CCLUP will be further accounted for in the next AAC determination.

*- recreation*

The TFL provides a number of recreation opportunities. The many lakes, rivers and streams are home to a variety of sport fish that attract anglers. The TFL has a large trail network used by hikers, mountain bikers, horseback riders and even dogsled mushers. Winter recreation activities include backcountry skiing and snowmobiling. This section on *recreation* and the section above on *visual quality* consider both the recreation and tourism targets of the CCLUP.

WFM maintains, under contract with BCFS, five recreation sites in the TFL area that provide rustic camping opportunities. The licensee undertook a recreation inventory as part of MP No. 2, and this was found to be complete and thorough by Cariboo Forest Region staff. MP No. 2 proposes to coordinate recreation use in its integrated resource management of the TFL; no specific timber supply allowances were made in the base case. WFM has provided resources to enable recreation management in the TFL in the past, and MP No. 2 proposes that WFM is prepared to provide a fixed monetary amount for every cubic metre harvested within the TFL portion of the Quesnel Highland SRDZ into a special recreational fund.

The CCLUP recreation target for the Quesnel Highland SRDZ is to maintain 30 percent of the zone in a backcountry condition. In order to be compatible with the timber targets, this includes areas above 5000 feet elevation, areas adjacent to the Cariboo River and areas adjacent to the Stanley-Cariboo Wagon Road. WFM indicates that about 40 percent of their portion of this zone does not contribute to the timber harvesting land base. Areas excluded in their base case primarily include alpine, non-productive forests, and high elevation caribou habitat areas that likely, on a proportional basis, meet the backcountry recreation targets of the CCLUP. Again, however, I must acknowledge that this could change as the plan objectives for the TFL become more clear. However in the absence of any better information to work with, I feel this provides a reasonable accounting for the risk of uncertainty associated with this CCLUP target.

The Quesnel Enhanced Resource Development Zone includes the requirement to manage approximately 3 lakes as quality lakes for wilderness fisheries. The exact location of the quality lakes has not yet been determined. If one or more fall within the TFL, it is uncertain whether or not the recreation management practices in the MP will adequately address this requirement. However, my judgement tells me that this is not likely to become a significant factor influencing timber supply and as it remains uncertain as to whether it will affect the TFL at all, I am not making any further adjustments beyond those already applied in the analysis to account for wilderness fishing. Any further clarification of this matter will be accounted for in the next determination.

For this determination, I accept that base case management assumptions for recreation reflect current practices and are reasonable given my current understanding of CCLUP implementation objectives.

(vi) **any other information that, in his opinion, relates to the capability of the area to produce timber;**

Other information relating to capability to produce timber

*- Cariboo-Chilcotin Land Use Plan*

*The Cariboo-Chilcotin Land Use Plan (CCLUP) and CCLUP 90-day Implementation Process Final Report* were prepared by the Government of British Columbia in October 1994 and February 1995, respectively. The CCLUP is a regional plan which identifies land use zones including new protected areas, special resource development zones (SRDZ), integrated resource management zones, and enhanced resource development zones (ERDZ). There are no new protected areas in TFL 52, although some relatively small Goal 2 protected areas are under consideration. Provisions of the CCLUP, including zones, targets and strategies where they are applicable to operational plans, were declared to be a Higher Level Plan under the Code in January 1996.

Implementation of the CCLUP currently has the benefit of a *CCLUP Interim Interpretive Guide* prepared in April 1996 and produced by the Cariboo Chilcotin Regional Resource Board (RRB) and the Cariboo Mid-Coast Interagency Management Committee (IAMC) as well as from other direction provided by government. The IAMC Implementation Committee presented a report, *CCLUP Integration Process*, in September 1996 to the RRB and IAMC who are now reviewing the document. Reports on Caribou, Mule Deer, Biodiversity and Short Term Timber Strategies as well as target review reports for recreation, tourism and fisheries were provided as input into the integration process. Additional implementation strategies such as for timber enhancement will also be initiated in the near future. Some of this information is being provided to the designated officials under the Forest Practices Code as information to consider when reviewing the 1997-2002 forest development plans for consistency with the CCLUP.

With these many in-progress efforts towards the implementation of the CCLUP, the timber supply implications are difficult to assess with certainty in this decision and I am mindful of the need to recognize the risk this introduces into this decision. I also expect that many of the uncertainties will be clarified prior to the next determination and this will bring more precision to the weighing of timber supply implications of the plan in the next determination. Also, subregional planning is a tool that will provide more detailed information on CCLUP implementation and that should improve timber supply assessments in the future.

Nonetheless, I recognize that I must take the CCLUP into account in this determination. Because of the need to ensure that the CCLUP can be reasonably implemented at a given harvest level, I convened a special meeting with the licensee and with Ministry staff who

are working on CCLUP implementation. The purpose of that meeting was to fully assess the relationship between the TFL 52 analysis and the CCLUP targets.

TFL 52, located within the CCLUP area, includes portions of the Quesnel Highlands SRDZ (57 percent of this entire SRDZ), Cottonwood ERDZ (59 percent) and Quesnel ERDZ (14 percent). The SRDZ represents about one-third of the total TFL area, while the two ERDZs represent about two-thirds of the TFL. Various resource targets have been developed for these two zones, but these targets need to be reconciled over the entire zone (which includes areas outside of the TFL) and the exact impact on the TFL 52 portion of these zones remains uncertain. The recent report on the *CCLUP Integration Process* has begun to look at this issue.

For now, I find it reasonable to account for this uncertainty by assuming a proportional contribution from the TFL to meeting the CCLUP resource targets. In the absence of any other clear direction, I am taking this position for the purpose of this decision with the understanding that I must account for the CCLUP regardless of how clear or unclear the implementation of targets is relative to this TFL.

With respect to timber targets, the CCLUP specifies a combined conventional and modified harvest target, relative to the entire productive forest land base, of 66, 89 and 94 percent of the area of the Quesnel Highlands SRDZ, Cottonwood and Quesnel ERDZs, respectively. The base case assumes for the TFL that the productive forest available for harvesting in these zones are 68, 92 and 98 percent, respectively. This appears to be reasonably close to the intent of the CCLUP, when looking at the proportional contribution of the TFL, such that the targets should be attainable without substantive risk to the TFL base case and I have noted this in my "Reasons for Decision."

I have discussed elsewhere in this document the attainability of several CCLUP non-timber resource targets and I have also considered this in my "Reasons for Decision."

*- twenty-year plan*

The licensee's 20-year plan for the TFL was reviewed and accepted by district staff in April 1996. The plan identifies an average harvest of 667 000 cubic metres per year, which is 68 000 cubic metres (11 percent) higher than the base case harvest forecast. Although riparian reserves and management zones that meet Code requirements have not yet been identified, the plan shows there is ample flexibility to meet these requirements with the likely attainment of the short term harvest levels indicated in the timber supply analysis for the base case.

WFM's 20-year plan became part of the Short Term (20 year) Timber Availability Assessment completed as input into the *CCLUP Integration Process*. Although the RRB/IAMC review of the report is not yet completed, no fundamental problems have been identified at the strategic level. Further work, including landscape level assessments

and subregional planning are expected to provide further information on management considerations required to ensure all CCLUP targets are addressed.

In my determination, I have also given consideration to medium and long term harvest levels beyond the 20 years outlined in the plan by carefully reviewing the other factors noted throughout this decision.

It must be noted that the purpose of a 20-year plan is to show whether the proposed harvest level is spatially feasible on the landscape over that period. I am satisfied that with the flexibility shown in this plan that this objective has been met even given the further management constraints noted throughout this document. However, the 20-year plan is not an operational plan and as such the proposed harvesting will likely have to be modified to meet any refined management objectives for a given area.

*- residual balsam stands*

The TFL contains a significant area of residual subalpine fir stands (hereafter referred to as "balsam"). These stands contain remnant mature balsam that were left on site following timber harvesting between the 1950s and '70s using intermediate utilization standards. Residual balsam stands occupy about 11 000 hectares, with 9115 hectares, or 5 percent, occurring in the timber harvesting land base. The Timberline analysis modelled the growth on 75 percent of the stands using VDYP, while TIPSYP was used for the remaining 25 percent of the stands.

Given the high variability in stocking levels in residual stands, they are difficult to sample and project volumes for. This introduces some measure of uncertainty about the volume projections for residual stands. A sensitivity analysis, therefore, was requested by the BCFS in order to show the implications if rehabilitation was necessary for all residual stands and recovered volume was only 50 cubic metres per hectare. The analysis showed no impact on short term harvest forecasts, but there would be a 10 percent reduction in timber supply between the seventh and eleventh decade of the harvest forecast.

Due to poor stocking, evidence of brush that inhibits reforestation of openings, and fungal damage to residual stems, WFM secured initial funding from FRBC to conduct surveys and develop prescriptions for 2882 hectares, about 26 percent of these stands. The recommended prescriptions from the survey were that 41 percent of the stands do not need treatment (i.e. they were adequately stocked), that about 40 percent need stand tending (i.e. they were largely overstocked), that selective salvage harvesting is appropriate on 12 percent, that fill planting is needed on about 5 percent, and that complete rehabilitation due to brush or poor coniferous stocking is needed on only about 2 percent of the area.

Therefore, while these residual stands may not fully achieve the volume projections used in the Timberline analysis, the stands surveyed show that complete rehabilitation is not

needed for most stands as examined in the sensitivity analysis. Nevertheless, there is the potential for medium term timber supply impacts if no management action (remedial treatment) is taken on these stands. I have accepted WFM's stated commitment to treat these stands in my approval of MP No. 2, and

I have asked the licensee to submit a treatment plan for approval as part of its 5-year silviculture plan.

For the purposes of this determination, I have accounted for the uncertainty in volume projections for residual balsam stands under "Reasons for Decision."

*- management plan 2 option*

One of the options reviewed in the Timberline analysis was the MP No. 2 option. This option recognizes a number of changes in forest management that have occurred, or that WFM believes are likely to occur, relative to the base case management assumptions. They include reducing the allowable disturbance in the FEN zone and in the small and large riparian management zones from 33 to 20 percent, and increasing old forest (>120 years) retention from 10 to 20 percent in these zones. Available timber volumes in these zones are reduced by 15 percent to account for wildlife tree patch retention. This option also includes any aspen stands that were excluded from the timber harvesting land base under the base case. The base case assumptions with respect to caribou habitat remained unchanged in this option.

The option shows no change in short and medium term timber supply relative to the base case, but a small (1 percent) decrease in timber supply occurs in the long term, beginning in about 140 years. In this option, the timber supply impacts of enhanced prescriptions for non-timber values in the riparian and FEN zones were partly offset by increased use of aspen stands. This option demonstrates some resilience in timber supply in the TFL to overall changes in management assumptions, and I have accounted for this in my "Reasons for Decision."

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

Harvest flow alternatives

The nature of the transition from harvesting old-growth forests to harvesting second-growth forests is a major consideration in determining AACs for areas with a significant old-growth component. Two alternative harvest forecasts were modelled for the TFL, and these confirm that the short term timber supply can be maintained without causing large disruptions in long term harvest levels. One alternative showed that harvests 10 percent above the base case could be maintained for two decades before stepping down to the long term harvest level in decade four. The other showed that a 5 percent increase in initial harvest levels could be maintained for four decades before dropping to the long term harvest level. In my determination, I am aware of the flexibility offered by the stock

of existing mature timber in this TFL that enables harvest levels at, or somewhat above, the initial base case harvest levels to be maintained without placing future timber supply or non-timber resource objectives at risk, while at the same time meeting the need for an orderly transition to the long term harvest level.

I am aware of the report, *Quesnel Timber Supply Area Socio-Economic Analysis (SEA)*, prepared by the BCFS Economics and Trade Branch. Given the overlapping geographic focus and fibre flow patterns between the TSA and TFL 52, it seems reasonable that the forestry employment and government revenue coefficients developed in the SEA would be applicable in describing the magnitude of the employment and government revenue impacts associated with TFL 52. The SEA indicates that each 100 000 cubic metres of AAC can support about 90 direct person-years of forest employment in local communities and about \$2.8 million per year in direct provincial government revenues. Applying the SEA to the TFL suggests that harvests at the base case level can support about 535 direct person-years of forest employment and \$17 million per year in direct provincial government revenues. I have recognized the considerable local and provincial socio-economic benefits of the timber harvesting activity from TFL 52 in my determination.

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

Timber processing facilities

WFM's MP No. 2 indicates that its Quesnel sawmill has an annual capacity of about 275 million board feet. Log input to the mill averaged just over 1 million cubic metres per year over the period 1994-95. A three-year mill modernization project is nearing completion and will improve the recovery rate of the mill, but the overall production capacity of the mill will remain unchanged. A recent WFM analysis of fibre flow shows about 44 percent of its sawmill's fibre comes from TFL 52, while about 22 percent comes from a replaceable forest licence in the Quesnel TSA. The remaining fibre comes from private purchases (about 29 percent) and from a non-replaceable forest licence (5 percent) in the Quesnel TSA. Therefore, I am aware that timber from TFL 52 provides a significant component of the supply to WFM's Quesnel sawmill.

**(d) the economic and social objectives of the Crown, as expressed by the minister, for the area, for the general region and for the Province; and**

Economic and social objectives

The Minister has expressed the economic and social objectives of the Crown for the province (letter and memo to Chief Forester attached as Appendices 3 and 4), and I understand these to apply to TFL 52. They are consistent with the objectives stated in the Forest Renewal Plan and include good forest stewardship, a stable timber supply, and allowance of time for communities to adjust to harvest level changes in a managed

transition from old growth to second growth forests, so as to provide for continuity of employment.

The Minister stated in his first letter, dated July 28, 1994 (Appendix 3), 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. The latter would likely require the use of alternative harvesting systems, and to encourage this the Minister suggested consideration of partitioned AACs. As discussed under *inoperability*, after other land base reductions are applied (such as for caribou habitat and environmentally sensitive areas), the TFL does not contain any uneconomical (inoperable) areas.

The Minister's July 28, 1994, letter suggested that the Chief Forester should consider important local social and economic objectives that may be derived from the public input in the timber supply review process. WFM advertised and held public information sessions in Quesnel and Wells. Over 20 people attended the public viewing and open houses regarding MP No. 2, and all persons were encouraged to take and complete a comment card. WFM received one written comment and one completed comment card. The main concerns were regarding recreation use conflicts and management of visually sensitive areas. I have reviewed this input and taken it into consideration in this determination. It should be noted that the public input did not otherwise provide any clarification on the attainment of CCLUP objectives at the proposed harvest level under the base case.

In general, if an opportunity arises to add to the timber supply in the short term, then I believe it is first preferable to use the additional available timber to reduce any harvest level instability over the medium and long term rather than elevate the initial harvest level at this time, at the expense of future harvest level stability. This principle is consistent with the social and economic objectives expressed by the Minister, as it acts to minimize AAC reductions now and in the future. It is therefore my view that socio-economic consequences of increasing the AAC now, only to have it decline again at a future date, would not be a responsible decision. Therefore, before raising the AAC I must be satisfied that an increase can be sustained in the medium and long term in light of any timber supply uncertainties. This principle of precaution also provides flexibility to deal with risk and uncertainty.

The Minister's recent memo of February 26, 1996, asks that pre-Code constraints applied to timber supply in order to meet visual quality objectives be re-examined when determining AACs in order to ensure that they do not unreasonably restrict timber supply. I have addressed this issue, under *visual quality* above, where I acknowledge that the use of partial cutting could reduce timber supply impacts in VQO zones. However, I have not



recognized this as an upward pressure on timber supply for this determination as there is no demonstrated performance of this practice at this time.

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

Abnormal infestations and major salvage programs

WFM assumed total average annual losses of 23 927 cubic metres for windthrow (23 194 cubic metres) and fire (733 cubic metres), and an average annual salvage of 22 230 cubic metres (93 percent) of these losses (22 034 cubic metres for windthrow and 196 cubic metres for fire). Total non-recoverable losses were estimated to be 1697 cubic metres for windthrow (1160 cubic metres) and fire (537 cubic metres), plus 5000 cubic metres for insects for a total of 6697 cubic metres per year. I note that allowances for non-recoverable losses for TFL 52 are similar to assumptions made in the BCFS analysis for the Quesnel TSA in that they both represent about 1 percent of their respective short and long term base case harvest levels.

WFM report that they have harvested 53 areas of patch blowdown ranging in size from 0.14 to 24 hectares with half of the blocks being less than 2 hectares in size. WFM is confident that given current access and early detection, control measures will prove effective in limiting losses due to infestations of bark beetles in the TFL. BCFS district staff confirm that WFM is very aggressive in its programs to recover losses due to windthrow, fire and insects.

On this basis, and in the absence of any conflicting information, I accept the licensee's assumption. I observe, however, that there is wide provincial variation on this factor and have initiated a provincial review of how this factor is quantified and used in timber supply forecasts. Improved guidance and any further analysis undertaken in the TFL may be useful for the next AAC determination.

## **Reasons for Decision**

In reaching my decision on an AAC for TFL 52, I have considered all of the factors presented above and have reasoned as follows.

The base case indicates there is considerable ability to buffer downward pressures on short term timber supply since it shows that harvest levels of 599 000 cubic metres (which is about 15 percent higher than the current AAC of 518 952 cubic metres), can be maintained for the entire 250-year analysis horizon. An examination of alternative harvest flows indicates the ability to increase harvest rates above the base case by 5 and 10 percent for a few decades (4 and 2 decades, respectively) without affecting medium and long term harvest rates. Sensitivity analysis also indicates a relatively high degree of stability in existing timber supply. For example, the short term harvest levels can still be maintained for 40 years even if there is a 5 percent reduction in the timber harvesting land base.

My considerations have identified factors that exert downward and upward influences on timber supply that were not accounted for in the base case due to changes in practices or information since the completion of the timber supply analysis.

The main factors identified as limiting short term timber supply relative to the base case forecast are associated with the implementation of the Forest Practices Code and are:

- *stand level biodiversity*: an unquantified impact due to provisions for stand-level biodiversity that include the need to retain wildlife tree patches. The *Forest Practices Code Timber Supply Analysis* indicates an average provincial timber supply impact of about 3 percent in the absence of landscape level biodiversity objectives; however, it is not known at this time what the impacts may be for TFL 52. While the exact impact is uncertain, it is not likely to differ radically from this estimate.
- *riparian habitats*: a 1 to 2 percent reduction in timber supply to account for riparian reserves and riparian management zones.

There are two other factors that represent a potential downward pressure on timber supply and which are unquantified at this time are:

- *residual balsam stands*: there is some uncertainty associated with assumed timber yields from these stands and sensitivity analysis indicates this can impact medium term harvest levels.
- *spruce weevil damage*: potential damage to established plantations would primarily impact timber supply in the long term.

Factors that represent an upward pressure on timber supply (that can help to offset downward impacts) relative to the base case are:

- *aspen stands*: up to 3400 cubic metres per year of additional timber volume to account for the inclusion of predominantly aspen stands. At this time, I consider this as only a minor upward pressure on timber supply as the supporting analysis did not fully account for the non-timber values in these stands.
- *silvicultural treatments*: an unquantified timber supply gain due to use of genetically improved stock and fertilization. This would improve long term timber supply.

I accept the licensee's base case as an adequate analysis from which to assess timber supply for the purposes of this AAC determination. However, I recognize that there are uncertainties in some factors that could increase timber supply, and some factors that could decrease timber supply. The net effect of weighing the upward and downward factors influencing timber supply causes me to believe that there is an overall downward pressure on timber supply beyond that

forecast in the base case. This is primarily due to continued implementation of the Forest Practices Code.

In reviewing the effect of the overall downward influences on timber supply, I take guidance from a sensitivity analysis that shows the impact of reducing the timber harvesting land base by 5 percent. This appears to be the order of magnitude of the impact when looking at upward and downward pressures on timber supply in TFL 52. This analysis shows that the initial harvest level in the base case can be maintained for 40 years before dropping 5 percent to a long term level of 568 100 cubic metres. I consider the 568 000 cubic metre level to represent the upper bounds of a reasonable range for consideration in this decision.

In my decision, I must also account for the CCLUP and its impact on timber supply in the TFL. To this end, I held an extra meeting with the licensee in order to better understand their ability to comply with CCLUP in the TFL. As discussed above, I want to be reasonably certain that any AAC increase can be sustained in light of any uncertainty as to how the CCLUP objectives and targets may impact timber supply in this TFL. There is some uncertainty associated with the application of the CCLUP targets to particular areas or subunits in the region, such as TFL 52. This issue is being partially addressed through a regional integration of resource targets, but this work and subsequent implementation processes, including subregional planning, is not yet complete. In the meantime, to account for risk and uncertainty in my decision, I have looked at the proportional contribution of the TFL to the attainment of the CCLUP regional or zonal targets.

I consider this to be a reasonable approach to account for uncertainty with CCLUP while at the same time recognizing the analysis brought forth by the licensee for consideration in this determination.

Indicators of the CCLUP that I have used to guide me in my decision include timber targets, backcountry recreation targets, and landscape level biodiversity targets using old and mature forest retention guidelines. As discussed previously under *Cariboo-Chilcotin Land Use Plan and recreation*, the timber and backcountry recreation targets appear achievable given the areas assumed to contribute, and not contribute, to the timber harvesting land base in the base case. However I also acknowledge that there is ongoing work which will further clarify the strategies for attaining these targets.

With respect to landscape level biodiversity, I take guidance from the sensitivity analysis which increases the old forest (>120 years) retention requirements on the productive forest land base to 20 percent (see *biodiversity*). This guidance enables me to examine the associated risk and uncertainty associated with this factor in this determination. Sensitivity analysis indicates the initial harvest level associated with a 20 percent old forest retention requirement is about 530 000 cubic metres. Because of the way the sensitivity analysis was applied individually to each management zone and operating area, as discussed under *biodiversity*, the analysis provides for more than 20 percent old forest retention requirement at the TFL level. Therefore, I consider this level to represent the lower bounds of a reasonable range for consideration in this decision. In my

decision, I must also allow for the need to meet CCLUP timber targets and, as discussed next below, account for the relatively stable timber supply in the TFL.

There are a number of examples given in the timber supply analysis that indicate the timber supply in the TFL appears quite resilient. For example, as discussed under *management plan 2 option*, this option includes enhanced provisions to accommodate non-timber values relative to the base case, yet shows no change in short and medium term timber supply, and has only a small (1 percent) decrease in the long term beginning in about 140 years from now. In addition, as discussed under *twenty-year plan*,

this plan identifies 11 percent more timber than the base case which indicates there is flexibility to meet short term harvest levels indicated in WFM's timber supply analysis.

However, in my decision, I must also give consideration to medium and long term harvests levels beyond 20 years and their compatibility with meeting non-timber resource targets.

Given the known upward and downward pressures on timber supply, and allowing for uncertainty, I am reluctant to raise the AAC as high as that indicated in the base case since there is a high probability that level could not be sustained in the medium term. In my determination, as discussed under Economic and social objectives, I want to raise the likelihood that any AAC increase can be sustained over the medium term so as not to cause unnecessary future impacts or adjustments on forest-dependent communities.

Overall, I am confident that an AAC for the next 5 years that is in-between the lower and upper bounds discussed above will not compromise either the CCLUP or the Code. This level should be stable through the medium and long term, but if new information and plan clarification shows otherwise, there should be sufficient flexibility to allow for change in the future. In my professional judgement, recognizing that the lower bound overstates the timber supply implications of retaining as much as 20 percent old forest at the TFL level and may compromise the attainment of CCLUP timber targets, and the upper bound does not fully capture my desire to retain flexibility in accounting for the CCLUP non-timber targets (such as in setting landscape level objectives for TFL 52), I have decided to select the middle of this range as a reasonable harvest level. This level provides a reasonable balancing of risk and uncertainty associated with the attainment of both timber and non-timber targets of the CCLUP.

I expect that future implementation of the Code and the CCLUP in the TFL will reduce the information uncertainties identified before the next determination. For this determination, I am confident that a modest increase in the AAC at this time will not compromise medium or long term timber supplies regardless of how CCLUP targets are refined specific to this TFL. If the target exercise provides sufficient clarity through the period of this management plan, I am prepared to revisit my decision sooner than the required 5 year review in order to reconcile any important differences.

## **Determination**

Effective December 1, 1996, the new AAC for TFL 52 will be 549 000 cubic metres, which represents about a 6 percent increase from the current AAC. The new AAC includes volumes

harvested through the Small Business Forest Enterprise Program. The new AAC excludes issued woodlot licences. This new AAC will remain in effect until a new AAC is determined, which must take place within five years of this determination.

### **Implementation of Decision**

This determination comes into effect on December 1, 1996, and corresponds with my approval of MP No. 2. Additional studies are needed before the next determination for incorporation into the next timber supply analysis (many of which I have specified in my approval of MP No. 2).

The additional studies are:

- further work to ensure consistency with the CCLUP based on implementation documents as developed;
  - complete reinventory before next determination guided by a reinventory plan for forest cover to be approved by the BCFS to ensure it is undertaken according to government standards;
  - determining appropriate allowances for roads, trails and landings based on information collected in the TFL;
  - developing management objectives for aspen stands to account for their non-timber values;
  - supporting the provincial paired-plot survey, including the establishment of permanent sample plots in the TFL;
  - assessing and mapping spruce weevil risk and developing a treatment plan;
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- determining the timber supply implications of Code implementation in this TFL, particularly concerning biodiversity and watershed hydrology; and
  - developing treatment plans for residual balsam stands and determining yield implications.



Larry Pedersen  
Chief Forester

November 5, 1996

## Appendix 1: Section 7 of the *Forest Act*

The B.C *Forest Act* Section 7 reads as follows:

### Allowable annual cut

7. (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.

(1.1) If, after the coming into force of this subsection, the minister

- (a) makes an order under section 6 (b) respecting a timber supply area, or
- (b) amends or enters into a tree farm licence to accomplish the result set out under section 33.1 (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.

(1.11) If

- (a) the allowable annual cut for the tree farm licence is reduced under section 7.1 (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 7.1 (6).

(1.12) If the allowable annual cut for the tree farm licence area is reduced under section 7.1 (3), the chief forester is not required to make the determination under subsection (1) or (1.1) of this section at the times set out in subsection (1) or (1.1) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 7.1 (2).

(1.2) [Repealed 1994-39-2.]

(1.3) 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 Province, the federal government, or both.

(2) The regional manager or district manager shall determine a volume of timber to be harvested under a woodlot licence during each year or other period of its term, according to the licence.

(3) In determining an allowable annual cut under this section the chief forester, despite anything to the contrary in an agreement listed in section 10, shall 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 his opinion, relates to the capability of the area to produce timber;
- (b) the short and long term implications to the Province 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 Crown, as expressed by the minister, for the area, for the general region and for the Province; 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.

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### **Documents attached:**

**Appendix 3:** Minister of Forests' letter of July 28, 1994 to Chief Forester, re social and economic objectives of the Crown.

**Appendix 4:** Minister of Forests' memo of February 26, 1996, to Chief Forester, re social and economic objectives of the Crown—visual resources.