

**BRITISH COLUMBIA  
MINISTRY OF FORESTS AND RANGE**

# **Tree Farm Licence 19**

**held by**

**Western Forest Products Inc.**

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

**Effective August 10, 2010**

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Deputy Chief Forester**

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## **Objective of this document**

This document provides an accounting of the factors I have considered, and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence (TFL) 19. This document also identifies where new or better information is needed for incorporation in future determinations.

## **Statutory framework**

Section 8 of the *Forest Act* requires the chief forester to consider a number of specified factors in determining AACs for timber supply areas (TSAs) and TFLs. Section 8 of the *Forest Act* is reproduced in full as Appendix 1 of this document.

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

## **Description of the TFL**

Tree Farm Licence 19 is held by Western Forest Products Inc. (WFP, 'the licensee') and is administered by the Ministry of Forests and Range (MFR) Campbell River Forest District office in Campbell River. The TFL is located on the west coast of Vancouver Island near Nootka Sound. It is bordered by the Strathcona TSA and Strathcona Provincial Park to the east, the Strathcona TSA to the west, WFP's TFLs 37 and TFL 39 to the north, and the Arrowsmith TSA to the south. The total land base of TFL 19 is 171 722 hectares of which 139 767 hectares, or 81 percent of the area, are considered to be productive forest. The long-term timber harvesting land base on TFL 19 is assumed to be 75 312 hectares.

The TFL is composed of rugged marine coastline, with steep mountainous terrain, and deep river valleys and inlets of the Pacific Ocean. The majority of the operable forest lies within the Coastal Western Hemlock (CWH) biogeoclimatic zone, with portions in the higher-elevation Mountain Hemlock (MH) zone. There are also large areas of unforested alpine tundra.

Two First Nations, the Mowachaht / Muchalaht First Nation and the Ehattesaht Tribe, assert traditional territories on TFL 19. There are six communities in the licence area, including Gold River, Tsaxana (Mowachaht / Muchalaht First Nation), Tahsis, Zeballos, and Ehatis (Ehattesaht First Nation). The livelihood of these communities and their economic stability depends mostly or in part on the resource activities within the Nootka Sound region. Harvesting operations in TFL 19 and adjacent forest and timber licenses are the major employment activities in Nootka Sound. Economic activity from fish farming, commercial and recreational fishing and expanding tourism is also important in the area.

## History of the AAC

The most recent AAC determined for TFL 19, effective August 1, 2001, was 940 000 cubic metres. In 2007 the private land was deleted and as a result the AAC was reduced to 921 200 cubic metres. Since then a British Columbia Timber Sales (BCTS) area with an AAC of 65 253 cubic metres was also deleted and as a result the AAC was reduced to 855 947 cubic metres.

## New AAC determination

Effective August 10, 2010, the new AAC for TFL 19 is 730 000 cubic metres. This level is about 15 percent less than the current AAC. This AAC will remain in effect until a new AAC is determined, which must take place within 10 years of this determination.

## Information sources used in the AAC determination

The information sources considered in determining this AAC for TFL 19 include references listed in the licensee's Timber Supply Information Package and Analysis Report and the following:

- *Western Forest Strategy: A program for conserving biodiversity on company tenures*, July 2007;
- *Yield Tables for Existing Stands* accepted by MFR Forest Analysis and Inventory Branch September 27, 2008;
- *Yield Tables for Managed Stands* accepted by MFR Research Branch February 6, 2008;
- *Site Index information* accepted by MFR Research Branch February 6, 2008;
- *Tree Farm Licence 19 Vegetation Resources Inventory Statistical Adjustment*, J.S. Thrower & Associates Ltd., January 18, 2007;
- *Report on the VRI Site Tree Selection Test at TFL 19, Gold River*, MFR Forest Analysis and Inventory Branch, September 30, 2009;
- *Draft Report on the VRI Site Tree Selection Test at TFL 19, Gold River*, MFR, January 8, 2009;
- *SIBEC and PSI Estimates for Major Site Series in TFL 19*, Timberline Natural Resource Group, June 29, 2007;
- *WFP Tree Farm Licence 19 Timber Supply Analysis Information Package, MP #10*, dated October, 2008;
- *WFP Tree Farm Licence 19 draft Management Plan Number 10, (MP #10)* submitted January, 2009;
- *WFP Tree Farm Licence 19 Timber Supply Analysis, MP #10*, dated January, 2009;
- *TFL 19 Twenty-year Plan*, accepted June 26, 2009;
- *Forest Practices Code of British Columbia Act*, current to March 17, 2010 and regulations and guidebooks;
- *Landscape Unit Planning Guide*, MFR and Ministry of Environment (MoE), March 1999;
- *Forest Practices Code Timber Supply Analysis MFR and MoE*, February, 1996;
- *Higher Level Plans: Policy and Procedures*, MFR and MoE, December, 1996;
- *Forest and Range Practices Act and Regulations*, current to March 17, 2010;
- *Forestry Revitalization Act*, current to March 17, 2010;
- *Tree Farm Licence 19 Rationale for Allowable Annual Cut Determination*; Ken Baker, Deputy Chief Forester, Effective August 1, 2001;

- *Ministry of Forests and Range Act*, current to March 17, 2010;
- *Order #3(4)7-1 – under the Forestry Revitalization Act*, January 23, 2007, Ministry of Forests and Range;
- *Order #3(4)7-2 – under the Forestry Revitalization Act*, March, 2008, Ministry of Forests and Range;
- *Instrument Number 72, TFL 19, Minister of Forests and Range*, July 15, 2009;
- *'Summary of dead potential volume estimates for the management units within the Coastal Forest Region'*, April 2006;
- *Identified Wildlife Management Strategy. Accounts and measures for managing identified wildlife: Coast Forest Region. Version 2004.* Province of BC;
- *Establishment of Scenic Areas and Visual Quality Objectives for the Campbell River Forest District*, December 14, 2005, MFR;
- *Notice – Indicators of the amount, distribution and attributes of wildlife habitat required for the survival of species at risk in the Campbell River Forest District*, Ministry of Environment, July 27, 2004;
- *Vancouver Island Land Use Plan Order*, October 2000;
- *Order Establishing Provincial Non-Spatial Old Growth Objectives*, effective June 30 2004;
- *Order - Ungulate Winter Range #U1-014*, December 19, 2004, Deputy Minister of Water, Land and Air Protection;
- *Order - Amendment to Ungulate Winter Range U-1-014, Unit F01d*, January 30, 2006, Deputy Minister of Environment;
- *Order - Amendment to Ungulate Winter Range U-1-014*, November 9, 2007, Deputy Minister of Environment;
- *Six orders establishing Wildlife Habitat Areas (WHAs)*;
- *First Nations Consultation Summary – TFL 19 Allowable Annual Cut Determination, Campbell River Forest District*, October 6, 2010;
- *Letter from the Minister of Forests and Range to the Chief Forester*, dated July 4, 2006, stating the Crown's economic and social objectives for the province;
- *Review and evaluation of current operating conditions on TFL 19 through comprehensive discussions with staff from the Ministry of Forests and Range (MFR) and the Ministry of Environment (MoE)*, including the AAC determination meeting held in Victoria, B.C. on October 21, 2009.

### **Role and limitations of the technical information used**

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

The analytical techniques used to assess timber supply necessarily are simplifications of the real world. Many of the factors used as inputs to timber supply analysis are uncertain, due in part to variation in physical, biological and social conditions. Ongoing scientific studies of ecological dynamics will help reduce some of this uncertainty.

Furthermore, computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Technical information and analysis, therefore, do not necessarily provide the complete answers or solutions to forest management

decisions such as AAC determinations. Such information does 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 determining this AAC for TFL 19 I have considered known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

### **Guiding principles for AAC determinations**

The chief forester has expressed the importance of consistency of judgement in making AAC determinations. I also recognize the need for consistency of approach, and am familiar with the guiding principles that the chief forester has employed in making AAC determinations. I find these principles to be reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 19.

Rapid changes in social values and in the understanding and management of complex forest ecosystems mean there is always uncertainty in the information used in AAC determinations. In making the large number of periodic determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in incorporating these changes and uncertainties. To make my approach in these matters explicit, I have set out the following body of guiding principles. In any specific circumstance where I may consider it necessary to deviate from these principles, I will explain my reasoning in detail.

Two important ways of dealing with uncertainty are:

- (i) minimizing risk, in respect of which in making AAC determinations I consider particular uncertainties associated with the information before me, and attempt to assess and address the various potential current and future, social, economic and environmental risks associated with a range of possible AACs; and
- (ii) redetermining AACs frequently, in cases where projections of short-term timber supply are not stable, to ensure they incorporate current information and knowledge. This principle is central to many of the guiding principles that follow.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I will reflect, as closely as possible, those forest management factors that are a reasonable extrapolation from current practices. It is not appropriate to base my decision on unsupported speculation with respect to factors that could affect the timber supply that are not substantiated by demonstrated performance or are beyond current legal requirements.

In many areas, the timber supply implications of some legislative provisions remain uncertain, particularly when considered in combination with other factors. In each AAC determination the chief forester takes this uncertainty into account to the extent possible in context of the best available information. In making my determination for TFL 19, as deputy chief forester, I have followed the same approach.

It is my practice not to speculate on timber supply impacts that may eventually result from land-use decisions not yet finalized by government. However, where specific protected areas, conservancies, or similar areas have been designated by legislation or by order in council, these areas are deducted from the timber harvesting land base (THLB). Although I do not consider these areas to contribute any harvestable volume to the timber supply in AAC determinations, they may contribute indirectly by providing forest cover requirements to help in meeting resource management objectives such as for biodiversity.

In some cases, even when government has made a formal land-use decision, it is not necessarily possible to fully analyse and account for the consequent timber supply impacts in a current AAC determination. Many government land-use decisions must be followed by detailed implementation decisions requiring, for instance, further detailed planning or legal designations such as those provided for under the *Land Act* and the *Forest and Range Practices Act* (FRPA). In cases where there is a clear intent by government to implement these decisions that have not yet been finalized, I will consider information that is relevant to the decision in a manner that is appropriate to the circumstance. The requirement for regular AAC reviews will ensure that future determinations address ongoing plan-implementation decisions.

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

Some persons 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 incomplete, but this will always be true where information is constantly evolving and management issues are changing. The requirement for regular AAC reviews will ensure that future determinations incorporate improved information.

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

With respect to First Nations' issues, I am aware of the Crown's legal obligation resulting from recent Court decisions to consult with First Nations regarding asserted rights and title (aboriginal interests) in a manner proportional to the strength of their aboriginal interests and the degree to which the decision may impact these interests. In this regard, I will consider the information provided to First Nations to explain the timber supply review (TSR) process and any information brought forward respecting First Nations' aboriginal interests including how these interests may be impacted, and any operational plans and actions that describe forest practices to address First Nations' interests, before I make my decision. As I am able, within the scope of my authority under Section 8 of the *Forest Act*, where appropriate I will seek to address aboriginal interests that will be impacted by my decision. When aboriginal interests are raised that are outside my jurisdiction, I will endeavour to forward these interests for consideration by appropriate decision makers.

The AAC that I determine should not be construed as limiting the Crown's obligations under the Court's decisions in any way, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within TFL 19. It is also independent of any decisions by the Minister of Forests and Range with respect to subsequent allocation of wood supply.

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

## **The role of the base case**

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

For most AAC determinations, a timber supply analysis is carried out using an information package including data and information from three categories – land base inventory, timber growth and yield, and management practices. Using this set of data and a computer simulation model, a series of timber supply forecasts can be produced, reflecting different starting harvest levels, rates of decline or increase, and potential trade-offs between short- and long-term harvest levels.

From a range of possible forecasts, one is chosen in which an attempt is made to avoid both excessive changes from decade to decade and significant timber shortages in the future, while ensuring the long-term productivity of forest lands. This is known as the ‘base case’ forecast, and forms the basis for comparison when assessing the effects of uncertainty on timber supply. The base case is designed to reflect current management practices.

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

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 resulting predictions of timber supply must be adjusted to more properly reflect the current situation.

These adjustments are made on the basis of informed judgement, using currently available information about forest management, and that information may well have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans. Thus, in reviewing the considerations that lead to the AAC determination, it is important to remember that the AAC determination itself is not simply a calculation. Even though the timber supply analysis I am provided is integral to those considerations, the AAC determination is a synthesis of judgement and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgements that in part may be based on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation would be gained by attempting a computer analysis of the combined considerations.

## **Timber supply analysis**

The timber supply analysis for TFL 19 was prepared by the licensee using Remsoft’s semi-spatial planning system Woodstock.

The inventory used in the analysis was current to the beginning of 2007. As a result, all harvest forecasts presented in the analysis start in 2007. The 870 000 cubic metres per year harvest level modelled for the first five-year period of the base case was calculated by the licensee using the weighted average of two years at the last AAC of 845 947 cubic metres, three years at 786 667 cubic metres per year, a level that is seven percent lower than the last AAC, plus a



one-period addition of 60 000 cubic metres per year that represents a 300 000 cubic metre undercut carry forward.

In the base case, the initial harvest level of 870 000 cubic metres per year was maintained for five years, followed by a 13 percent decline to 753 000 cubic metres per year. Over the next 20 years the harvest level declined further by seven percent each five-year period to a mid-term low of 561 700 cubic metres per year. This harvest level was maintained for 45 years before increasing by six percent to 595 700 cubic metres per year at year 71. It was maintained for 15 years. At year 86 the harvest level increased by nine percent to the long-term level of 650 500 cubic metres per year.

In the timber supply analysis, various sensitivity analyses were conducted to assess the potential implications for timber supply arising from uncertainty in data assumptions and estimates. These analyses have also assisted me in considering the factors leading to my determination.

Regarding the accounting for the undercut carry forward in the initial harvest level, I am aware that in order to dispose of the undercut, non-replaceable forest licenses have been issued; however, little of this volume has been harvested to date. It is also uncertain how much will be harvested in the near future as some of these licenses are soon to expire, and whether or not the licensee will continue to undercut the AAC for TFL 19. I note that carried forward undercut volume is often not harvested. For this reason undercut volumes are usually not accounted for in the AAC determination. If the undercut volume does get harvested, the amount of timber volume depleted from the inventory will be accounted for in future determinations. Nevertheless, having reviewed in detail the assumptions and methodology incorporated in the base case, for this determination I am satisfied, subject to the qualifications accounted for in various sections of this document, that this harvest forecast provides a suitable baseline from which I can assess the timber supply for TFL 19.

### **Consideration of factors as required by Section 8 of the *Forest Act***

I have reviewed the information for all of the factors required under Section 8 of the *Forest Act*. Where I have concluded that the modelling of a factor in the base case appropriately represents current management or the best available information and uncertainties about the factor have little influence on the timber supply projected in the base case, no discussion is included in this rationale. These factors are listed below in Table 1 and grouped according to the section of the *Forest Act* to which they apply.

**Table 1. List of factors for which modelling assumptions in the base case have been accepted.**

<b>Section of <i>Forest Act</i> and description</b>	<b>Factor(s) accepted as modelled</b>
8(8)(a)(i) Composition of the forest and expected rate of growth	Non-productive and non-forested reductions Non-commercial brush Environmentally sensitive areas Non-merchantable forest types Deciduous-leading stands Roads, trails and landings (existing and future) Aggregation procedures Volume estimates for existing unmanaged stands Volume estimates for managed stands Operational adjustment factors Harvest species profile sequencing
8(8)(a)(ii) Expected time for the forest to be re-established following denudation	Regeneration delay Not satisfactorily restocked areas Impediments to prompt regeneration
8(8)(a)(iii) Silvicultural treatments to be applied	Silvicultural systems Regeneration Use of select seed Fertilization, spacing and thinning Non-commercial brush conversion
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste and breakage	Utilization standards and compliance Decay, waste and breakage
8(3)(a)(v) Constraints on the amount of timber	Adjacency Landscape-level biodiversity Recreation considerations Visual quality management Watershed management Vancouver Island Land Use Plan
8(8)(b) Short and long-term implications of alternative rates of timber harvesting from the area	Alternative rates of harvest
8(8)(d) Economic and social objectives of the government	Employment and community-related factors
(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	

For other factors, where more uncertainty exists, or where public or First Nations' input suggests contention regarding the information used, the modelling techniques, or some other aspect under

consideration, I have stated below how I considered the information or the issues raised in making my determination.

**Section 8 (8)**

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

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

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

Land base contributing to timber harvesting

*- general comments*

The total area of TFL 19 is 171 722 hectares. For this analysis, 139 767 hectares, or 81 percent of total the area, is considered to be productive forest land.

As part of the process used to define the THLB (i.e., the land base estimated to be biologically and economically available for harvesting), a series of deductions were applied to the productive forest land base. These deductions account for the factors that effectively reduce the suitability or availability of the productive forest area for harvest due to ecological or economic reasons. In the base case for TFL 19, the deductions result in a long-term THLB of 75 312 hectares. This area is about 54 percent of the productive forest land base.

*- operability, terrain stability and low productivity*

On TFL 19 those portions of the productive forest area that are considered not physically accessible for harvesting, that are physically operable but have low timber growing potential, or that are not expected to be feasible to harvest economically, are categorized as inoperable and excluded when deriving the THLB. Areas classified as marginal, where timber harvesting under normal market conditions is not justified given harvesting costs and the expected value of the timber, were also excluded. For the purposes of this analysis, only areas classified as operable were included in the THLB.

The operability mapping used for this determination is the same as the mapping used for the 2001 determination. When identifying the operable land base, the licensee considered terrain stability as one of the factors that limits the possibility of harvesting an area. In the 2001 rationale, there was concern over the significant area in terrain stability class IV and V on slopes greater than 80 percent that was considered operable. As a result, there was a request that the licensee report annually on the amount of area harvested from terrain stability classes IV and V (least stable terrain) by leading species, height class and slope class. In response, harvest areas by terrain stability class were reported for the term of management plan (MP) No. 9 (2001-2006) and were summarized in the current information package. The reporting completed by the licensee shows they are adequately harvesting stands on terrain stability class IV and V on slopes greater than 80 percent.

The licensee was also requested to report the harvested areas within each operability category, by harvest method (conventional and non-conventional), leading species, and height class as well as confirm the upper Leiner and Berman drainages are operable.

The licensee reported harvesting performance as requested and district staff confirm the licensee is adequately harvesting in the non-conventional land base.

District staff indicate the analysis assumptions in this regard were appropriate. The Berman and the majority of the Upper Leiner drainages have now been confirmed as operable and were again included in the THLB in the base case.

Non-conventional areas comprise approximately 12 percent of the THLB on TFL 19. In the base case, the harvest contribution of the non-conventional areas was limited to 50 000 cubic metres per year, which reflects current performance on the TFL. A sensitivity analysis was completed to test the impact of excluding all non-conventional areas from the THLB. The sensitivity analysis results suggest that mid-term timber supply would be reduced by 20 percent on this account.

I have considered the information regarding operability on TFL 19 and the associated assumptions made in the base case. Given the reported harvest performance in the various operability categories, I am satisfied that the base case assumptions regarding operability appropriately reflect current harvesting practices on TFL 19. As a result, I make no adjustment on this account in this determination. However, I request that the licensee continue to monitor its actual harvesting performance in the non-conventional land base and I will discuss this further under '**Implementation**'.

#### Existing forest inventory

A Vegetation Resources Inventory (VRI) for TFL 19 was initiated in 2000 and completed in 2007. Phase I (photo interpretation) was completed in 2002, Phase II (ground sampling) in 2004, and Net Volume Adjustment Factor (NVAF) sampling in 2004. The final statistical adjustment of the VRI was completed in 2007.

MFR staff raised concerns during the timber supply review (TSR) process about the quality of the new VRI for TFL 19. These included:

Phase I (photo interpretation): old growth polygons were not re-delineated during phase I of the VRI as is the normal standard. Only the immature polygons were re-delineated to standard.

Phase II (ground sampling): non-standard site tree selection was used when 'intermediate' site trees were chosen rather than standard, 'dominant' and 'co-dominant' site trees.

Height and volume adjustment: a non-standard method of height and volume adjustment was used and, although there was unknown bias to the data, it was concluded the results were reasonable and acceptable for use in the TSR process.

In 2009, due to concerns with the Phase II sampling, the MFR Forest Analysis and Inventory Branch (FAIB) staff completed a field test to determine the difference between heights and ages of stands using the non-standard site tree selection procedures and standard procedures. They found that while the non-standard statistical adjustments applied resulted in decreased heights and ages, particularly in natural mature cedar and cypress stands, the NVAF adjustments largely offset the differences. As a result, MFR staff found that overall the volume estimates derived for mature stands are reasonable using these adjusted attributes and represent the best available information for use in the analysis.

The sampling and statistical adjustment process has also caused some uncertainty in the volume estimates of immature, natural stands. Any impacts to timber supply of incorrect volume estimates for these stands would occur in the mid-term when, in the case of TFL 19, the timber supply is quite sensitive to changes in yield estimates.

Due to the uncertainty associated with the inventory information, in particular with immature natural stands and mature cedar cypress stands, I believe there is a need to review the available inventory data for TFL 19 and explore methods of improving its reliability for the next determination. There is also value in revisiting the Phase II (ground sampling) plots for the

mature cedar cypress stratum. I recommend that the licensee work with FAIB staff to develop a strategy for improving the quality of the inventory information prior to the next determination and I discuss this further under '**Implementation**'. In summary, having reviewed the inventory information with MFR staff, I find the forest inventory is adequate for the term of this determination.

*- coastal log grades*

On the coast of BC, logs from trees that were dead prior to harvest have been harvested, scaled and charged to the AAC. Dead western redcedar and old growth Douglas-fir stems can remain sound and potentially suitable for milling for many years. However, dead potential volume is not currently included in the inventory volumes, and therefore has not been accounted for in previous AAC determinations.

Estimates using inventory audit data show in existing unmanaged stands, the dead potential volume could be as high as 11 percent of the volume estimated for living trees. On the other hand, district staff indicate that dead timber is rarely salvaged as it is unmarketable or downgraded due to checking and defects. Since there is also considerable breakage with this timber, staff estimate that up to two percent is likely salvaged in the short term.

I note dead potential volume is primarily a consideration in old-growth stands, and is not a factor in second-growth stands. Thus any underestimation of timber supply on account of this factor acts only in the short term. For this determination I consider the short-term timber supply has been underestimated by up to two percent and I discuss this further in '**Reasons for Decision**'.

Expected rate of growth

*- site productivity estimates*

The productivity of a site largely determines how quickly trees grow. This in turn affects the time seedlings will take to reach green-up conditions, the volume of timber that can be produced, and the ages at which a stand will satisfy mature forest cover requirements and reach a merchantable size. Site productivity is often expressed in terms of site index (SI), which is based on a stand's height as a function of its age. For this analysis, the licensee obtained site index estimates using different approaches for natural and managed stands.

Site indices for existing natural stands were derived from the adjusted inventory ages and heights. Site indices for existing and future managed stands were based on the provincial site index biogeoclimatic ecosystem classification (SIBEC) system.

MFR staff note that according to the 2007 VRI statistical adjustment report provided by the licensee, the adjusted inventory site indices were on average 19 percent lower than they would have been using the Phase I inventory (unadjusted) heights and ages. As I discussed above under '*Existing forest inventory*', the heights and ages derived in Phase II of the VRI for TFL 19 are subject to uncertainty. As these two parameters form the basis of site index estimation for existing natural stands, site indices for these stands developed using the VRI Phase II information for TFL 19 are also subject to uncertainty.

MFR staff believe the TFL 19 site indices for existing natural mature stands (aged over 120 years) are underestimated; however, the volumes of these stands were assumed to remain static at the currently estimated volume in the inventory until they were harvested in the model. Therefore, for the analysis site index had no additional influence on the volume estimates for mature stands, as NVAF adjusted these volumes.

Immature natural stands were defined in the analysis as stands aged from 46 to 120 years and they cover 10 355 hectares, or 13 percent of the THLB. For these stands the adjusted ages and

heights from Phase II of the VRI were used to estimate site index. MFR staff note that the resulting site indices were on average 16 percent lower than they would have been using the Phase I inventory (unadjusted) heights and ages. The licensee also pointed out that they were much lower than the site indices of similar stands in adjacent management units. This uncertainty is a concern because it affects the volume estimate of stands that will be available for harvest in the mid-term when timber supply is most limited.

For young stands age 0 to 45 years and all stands regenerating in the future, the licensee used SIBEC site index estimates in conjunction with the terrestrial ecosystem mapping (TEM) completed in 2000. This method is generally accepted as reliable; however, to complete the mapping process, additional field data must be collected and an accuracy and quality assessment must be completed in accordance with MFR policy. This has not yet been completed, but the SIBEC data based on the TEM for use in the base case was accepted because it was considered to provide better information about site productivity than the adjusted inventory site indices.

A sensitivity analysis which examined the effect of reducing the SIBEC site index estimates by three metres was provided. The mid-term timber supply in the resulting harvest forecast was reduced by about 11 percent and the long-term level was reduced by about 21 percent.

A second sensitivity analysis was provided in which Timberline's (now known as TECO) preliminary site index (PSI) estimates using data gathered in site index adjustment (SIA) projects for other coastal management units was used. The resulting harvest forecast was similar to the base case in the short- and mid-term, but timber supply increased to the long-term harvest level sooner than in the base case and it was eight percent higher compared to the base case.

Having considered all the information regarding site index for TFL 19, I find the site index estimates used in the base case for existing natural mature stands, while likely representing an underestimation of site productivity, do not affect the timber supply projections in the short term and I make no further adjustments on this account. With respect to existing and future managed stands, I accept the derived SIBEC site indices are the best available information for this determination. However, to reduce the uncertainty in these estimates I request that the terrestrial ecosystem mapping (TEM) be reviewed and the accuracy assessment or an equivalent quality assurance procedure be completed prior to the next determination and I will discuss this further under '**Implementation**'.

With respect to the adjusted inventory site indices for existing, immature natural stands used in the base case, I believe they underestimate the site productivity of these stands, and correspondingly timber supply. As a result, the contribution to mid-term timber supply of stands on 13 percent of the THLB has likely been underestimated by up to 16 percent. I discuss this further under '**Reasons for Decision**'.

*- minimum merchantability criteria*

Minimum merchantability criteria are used to derive estimates of the earliest age at which a forest stand has reached a harvestable condition. In the base case, minimum merchantability criteria were based on stands attaining a minimum volume of 350 cubic metres per hectare. In addition, stands had to reach a minimum age ranging from 50 to 100 years for combinations of three site productivity classes and two species groups. Both the minimum volume and minimum age requirements had to be met before a stand was assumed to be harvestable in the model.

District staff noted that some stands may be uneconomical to harvest given the minimum volume for the merchantability criteria assumed in the base case, particularly in the areas where harvesting is only possible using non-conventional harvest methods. Such areas comprise 12 percent of the THLB on TFL 19.

The licensee prepared a sensitivity analysis to assess the timber supply impacts of increasing the minimum volume criteria to 450 cubic metres per hectare and increasing each of the age minima by 10 years for all stands on the THLB. These changes resulted in a significant reduction in timber supply after the second decade of the harvest forecast relative to the base case.

I have reviewed the minimum merchantability criteria assumed in the base case, and I concur with district staff that, at the volume and ages assumed in the base case, some stands will likely not yet have reached a harvestable condition on the non-conventional land base. The associated risk to timber supply forecasts are likely reduced by the restriction applied in the base case to the harvest contribution from the non-conventional land base of 50 000 cubic metres per year. Nevertheless, I expect there is unquantified risk that the mid-term timber supply has been overestimated on the non-conventional land base, and I will discuss this further under ‘**Reasons for Decision**’.

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

As noted in Table 1, I accept these factors as modelled in the base case.

- (iii) **silvicultural treatments to be applied to the area:**

**Section 8(8)(a)(iii) silvicultural treatments to be applied to the area:**

Silvicultural Systems

The majority of TFL 19 is harvested using clearcut and clearcut-with-reserves, and this system was modelled in the base case.

Since the analysis was completed, the licensee has recently implemented its *Western Forest Strategy: a program for conserving biodiversity on company tenures (Forest Strategy)*. The approach involves varying the amount of stand retention by resource management zones as provided in the Vancouver Island Land Use Plan (VILUP) and by ecosection and variant. The retention system results in overall average stand-level retention of 5.6 percent for TFL 19. The licensee estimates this is about three percent more than the amount reserved in the base case for stand-level retention for at least one rotation.

A sensitivity analysis was completed to test the impact of implementing the retention systems according to the licensee’s *Forest Strategy*. The results indicate that short-term timber supply is reduced by about four percent (600 000 cubic metres) over the first 20 years and by three percent in the mid-term. Over the entire forecast period, the timber supply was reduced on average by four percent.

I have considered the information regarding the silvicultural systems and the forest strategy now used on TFL 19. I note that practices consistent with the VILUP were assumed in the base case. Now that the new forest strategy has been implemented, as shown by the sensitivity analysis, the short-term timber supply has been overestimated by up to four percent on this account and I will discuss this and any possible overlaps with other assumptions pertaining to forest retention under ‘**Reasons for Decision**’.

- (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:**

As noted in Table 1, I accept these factors as modelled in the base case.

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

Integrated resource management objectives

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

I have reviewed the information presented to me regarding the base case assumptions for several factors related to integrated resource management and I accept these as modelled in the base case. They are listed in Table 1.

*- stand-level biodiversity*

Stand-level biodiversity management includes retaining wildlife tree patches (WTP) within or adjacent to cutblocks to provide structural diversity and wildlife habitat. According to the licensee, total stand-level retention on TFL 19 currently averages 14 percent.

Operationally, where feasible and appropriate, WTPs are often located in areas already retained to meet other objectives, or excluded from harvesting for other factors such as riparian reserves and inoperable areas. Consistent with the guidance in the *Forest Practices Code Timber Supply Analysis*, the licensee assumed that 75 percent of WTP areas are located in this manner. The remaining four-percent retention requirement was applied as a volume reduction to the yield tables used in the base case. The licensee notes that it expects this retention level will also adequately address gulley management areas around non-fish bearing streams and account for basal area retention in riparian management zones and other areas.

As noted below under ‘*riparian reserves and management zones*’, retention to accommodate additional resource features is expected operationally. I note also that according to the licensee’s forest stewardship plan (FSP), it expects this amount will increase to an average of seven percent.

Increasing the level of assumed retention from four percent to seven percent represents a three percent overestimate of timber supply over the forecast period. I acknowledge that increased stand-level retention resulting from implementation of the licensee’s *Forest Strategy* likely overlaps with retention for WTPs, and I will discuss this further under ‘**Reasons for Decision**’.

*- riparian reserves and management zones*

Riparian habitat occurs along streams and around lakes and wetlands. Reconnaissance-level fish and fish habitat inventories to resource inventory committee (RIC) standards were completed on the TFL between 1999 and 2002. Detailed mapping of riparian features has been on-going since 1988 as part of development planning.

For the base case, the licensee used the available stream, lake and wetland mapping and applied reserves to streams classified as fish-bearing, lakes and wetlands in accordance with specifications in the *Forest and Range Practices Act*. A total of 3773 hectares (before other, possibly overlapping deductions) were excluded from the THLB on this account.

As noted above, the licensee assumed the volume reduction applied to the yield tables to account for wildlife tree patches would also account for retention within riparian management zones, including along unmapped streams. The licensee indicated these streams are generally narrow



and are not expected to be fish bearing. The licensee documented that based on operational experience, within-block retention in riparian management zones has been minimal and it does not expect this to change in future.

Ministry of Environment staff indicated that breeding ponds for red-legged frogs occur around W4 wetlands and that, while the licensee commits to managing these in its forest stewardship plan, the riparian management zones around these wetlands were not explicitly accounted for in the base case. The licensee indicated that WTPs will be located to protect the frog habitat.

I have reviewed the reduction of 3773 hectares for riparian reserves and I find it to be reasonable. However, I am concerned about the volume reduction for WTPs assumed to account for all the other areas where retention is required, including: unmapped streams that may be fish bearing, riparian management zones, gully management areas around non-fish-bearing streams, red-tailed frog habitat, and culturally modified trees as discussed below. Nonetheless, I note the overlap with the three percent retention, as discussed above under ‘*stand level biodiversity*’, and the increasing retention under the licensee’s *Forest Strategy*. I will discuss the interaction of the various assumptions about retention further under ‘**Reasons for Decision**’. Under ‘**Implementation**’ I have included an instruction that the licensee continue to monitor actual retention levels applied so they can be improved for the next timber supply review.

- *wildlife management*

While I accept the assumptions applied in the base case for wildlife management for this determination, I wish to highlight ongoing efforts to identify areas suitable for marbled murrelet nesting habitat as described below.

- *marbled murrelet*

The Ministry of Environment has issued a legal notice for species at risk under Section 7 of the *Forest Planning and Practices Regulation* that requires licensees to prepare results and strategies for marbled murrelet nesting habitat for 1431 hectares of THLB in the Campbell River Forest District. In addition, the notice requires that licensees prepare results and strategies that protect an amount of suitable marbled murrelet nesting habitat in the non-contributing land base equal to the amount designated at the time the Section 7 notice was issued.

WFP has worked with MOE staff and identified a total of 704 hectares of established and draft wildlife habitat areas for marbled murrelet and excluded this area from the THLB for the base case. According to the licensee it tracks the amount of suitable marbled murrelet habitat that is harvested on the non-contributing land base and ensures there is adequate habitat on the THLB to replace the harvested habitat. The licensee indicates that, to date, only three hectares of marbled murrelet habitat have been harvested on the non-contributing land base.

MOE staff suggest that the licensee use the BC Coastal Marbled Murrelet Habitat Suitability Model or low-level aerial survey to assist them in identifying suitable habitat on TFL 19 for the next timber supply review and I concur with this suggestion. For this determination I find the assumptions applied in the base case for this factor are reasonable and I make no adjustment on this account.

- *First Nations’ archaeological sites, culturally modified trees, and cultural heritage resource values*

The *Forest Act* defines a cultural heritage resource as ‘an object, site, or location of a traditional societal practice that is of historical, cultural or archaeological significance to the province, a community, or an aboriginal people’.

In TFL 19, an archaeological overview assessment (AOA) was completed in 1988 and later updated in 2007. AOAs are used in operational planning to assess the potential for finding evidence of historic use, and to identify sites that may require more detailed field assessment. The TFL encompasses a relatively high number of known archaeological sites, and based on an overlay of the *Northern Nuu-chah-nulth Archaeological Overview Assessment* with the THLB, about 12 percent of the THLB has moderate to high potential for culturally modified trees (CMTs) and archaeological features.

Recently, several CMTs were identified on cutblocks within the harvest boundary. According to the licensee, the majority of these were harvested under site alteration permits issued under the *Heritage Conservation Act*. Permits are required when work is to be conducted that would alter ground features such as CMTs that are located within the boundary of a protected archaeological site. It is unlikely that site alteration permits would be issued for all harvest areas given the importance of CMTs to First Nations.

Therefore, in consideration of the *Heritage Conservation Act* and the moderate to high potential for CMTs on the TFL, the licensee has committed to work closely with First Nations to determine archaeological potential, and to determine where to conduct preliminary field reconnaissance. This will include referring the location of cutblocks and roads to First Nations where there is archaeological potential or known features, or where a First Nation has requested a referral. The licensee will also operationally manage archaeological resources including CMTs using the following guidelines:

1. Retention of areas for wildlife tree patches (WTPs) and riparian reserves will be located where CMTs are found;
2. Provisions in the licensee's forest stewardship plan (FSP) for managing, conserving, and protecting cultural heritage resources that are not already covered by other arrangements will be employed to manage archaeological resources. Also under the FSP, opportunities will be maintained for First Nations to access cedar bark and cultural cedar timber.

The Mowachaht/Muchalaht First Nation (MMFN) expressed concern regarding the lack of accounting in the analysis for cultural heritage resources and in particular CMTs. They requested that no further cutting of CMTs be permitted within their territory as they assert CMTs are their standing museum and are representative of their cultural identity.

District staff note that based on recent archaeological assessments, there are likely thousands of bark-stripped CMTs remaining on TFL 19. Therefore, district staff will work with the Archaeology Branch of the Ministry of Tourism, Culture and the Arts, because they regulate archaeological features in British Columbia and provide guidance on when and where CMTs should be preserved, endeavouring to preserve representative samples as appropriate. Both district staff and the licensee are receptive to preserving representative stands where First Nations desire preservation, and I understand that discussions are held between First Nations and the licensee, both at the planning and field reconnaissance stages.

Where archaeological sites or cultural heritage resources have been identified, there has been significant overlap with areas reserved from harvesting for other reasons. As well, where the First Nation has clearly identified that there is to be no impact on any archaeological features, alternative silvicultural systems including uneven-aged management and high retention systems have been utilized by the licensee.

District staff have asked First Nations where and how specific asserted aboriginal rights are practiced so that, where appropriate, protection of the associated values can be addressed in an AAC determination. To date, First Nations have not provided such information to government or

to the licensee. However, I am aware of the importance First Nations place on old-growth red and yellow-cedar and maintaining access to them now and in the future. Retention of these species and the recruitment of younger cedar and cypress stands to provide for future First Nations' cedar requirements is a priority.

From my discussions with district staff I understand that uncertainties remain in the number, size, type and location of archaeological sites, and therefore in the related individual and overall impacts on timber supply. As I indicated under '*riparian resources*', my consideration of the assumptions applied in the base case for WTPs, along with the implementation of higher retention levels under the licensee's *Forest Strategy*, may provide some accounting for management of archaeological resources; however, given the uncertainty, there is a risk to the timber supply that CMTs have not been sufficiently accounted for and I will discuss the interactions and uncertainties further under '**Reasons for Decision**'. As more information on archaeological resources becomes available, this can more accurately be incorporated into future analyses and AAC determinations.

I recommend that a collaborative strategy between the licensee, MFR staff, and First Nations representatives, be initiated to provide guidance when considering First Nations' cedar interests and in particular, to better assess the available supply of cedar.

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

#### Other information

##### *- First Nations' considerations*

Two First Nations, the Mowachaht / Muchalaht (MMFN) and Ehattesaht have asserted traditional territory overlapping TFL 19. Both First Nations have forest agreements with MFR, which provide for revenue sharing and forest tenure opportunities. The agreements include provisions for consultation on administrative decisions, including AAC determinations, and these were followed by district staff.

Consultation with these two First Nations on the timber supply review for TFL 19 was initiated by the Campbell River Forest District in February 2008 and concluded in September 2009. The consultation process also included information sharing by the licensee, who provided the draft information package, draft Management Plan #10, and the timber supply analysis report to these First Nations.

The Campbell River Forest District sent a letter to the MMFN and Ehattesaht First Nation to initiate consultation in February 2008. At that time, the licensee also provided the draft information package to the First Nations along with a follow-up letter a few weeks later requesting their review and comment. District staff sent an additional letter in November 2008 reminding First Nations that consultation on the information package was still ongoing. In February 2009, the licensee provided the draft Management Plan #10 and timber supply analysis report to First Nations and asked for their review and comment. The district followed up with a letter encouraging participation and offering to meet.

The Ehattesaht First Nation did not provide input to the timber supply review process for TFL 19. The Ehattesaht asserted traditional territory does not overlap with that of the MMFN in TFL 19. District staff believe that the Ehattesaht's strongest interests are associated with the areas adjacent to ocean shoreline, largely located outside TFL 19, and to a lesser extent freshwater bodies. Although no comments were provided, district staff believe the Ehattesaht is interested in

protecting its traditional aboriginal rights such as hunting, fishing, berry picking, access to cedar and ethnobotanicals, and spiritual uses of the land. The cedar resource is especially important to them for preservation of their culture through traditional carving and other art forms. District staff note that the Ehattesaht typically work closely with the licensee at the operational planning level.

In April 2009 a meeting took place between district staff and the MMFN. Discussion focused on various consultation processes, and the MMFN requested funding for traditional use studies and for the development of an improved consultation protocol. The MFR's preliminary assessment of MMFN's aboriginal interests based on the information available to MFR, the potential impact the proposed AAC decision may have on these interests, and the suggested level of consultation was also shared at this meeting. After this meeting, MMFN's legal counsel requested further information, which led to an exchange of information. In May 2009, a second meeting was held between district staff and the MMFN and issues such as capacity funding, response time for referrals, process related issues, CMT protocol, cultural heritage interests, access to cedar, and the MFR's preliminary assessment of MMFN claims were discussed.

Following the meeting, the MMFN's legal counsel sent a letter outlining MMFN's concerns.

District staff responded to these concerns in a meeting with the MMFN in September 2009. At this meeting, district staff presented an update on the TFL 19 timber supply review consultation and noted any outstanding issues. Discussions were held regarding the concerns, the preliminary assessment, management of CMTs, and district staff requested MMFN to identify any aboriginal interests that may be impacted by an AAC decision. To date, the information provided by the MMFN has been general, and it asserts its aboriginal interests are throughout the traditional territory.

I acknowledge the MMFN has expressed concerns about the operational protection of its interests. I note that in my determination I evaluate whether the timber supply analysis incorporates assumptions that are consistent with practices that would protect aboriginal interests, and I reflect my conclusions in the AAC decision. As stated previously in the analysis, reductions were applied for riparian areas and wildlife tree reserves, and this accounting reflects aboriginal cultural and other interests. I also have taken into account in this determination the timber supply implications of retention areas beyond what was assumed in the base case. In addition, the licensee has included accounting for wildlife habitat and landscape-level biodiversity in its base case, factors that generally reflect requirements for maintenance old growth areas. I believe these areas also overlap with First Nations aboriginal interests.

Further, as referenced under '*First Nations' archaeological sites, culturally modified trees, and cultural heritage resource values*', given the uncertainties about the number of cultural heritage resources and cultural sites on the TFL, I recognize that additional measures beyond those reflected in the base case may be required. It is not certain, however, to what extent my assessment of requirements for retention for other reasons may reflect protection for these features, and I discuss this further under '**Reasons for Decision**'.

I am also aware of MMFN's concerns regarding herbicide spraying, silviculture, the cumulative impacts of forest harvesting, and other factors, and I encourage the licensee and the district to continue to work at the operational level with MMFN to resolve these concerns.

I encourage district staff to continue to seek clarification regarding MMFN's aboriginal interests and I encourage work between the licensee and the First Nation to ensure appropriate operational measures are used to protect aboriginal interests. In addition, I am aware both red and yellow-cedar are important species to First Nations. As mentioned in the previous section, I request district staff, licensees and First Nations work together in developing a cedar strategy for

TFL 19 to address concerns about the management and future availability of red and yellow-cedar.

As noted above, the MMFN has asserted aboriginal title over the land contained in TFL 19. No conclusions have been reached on the extent to which aboriginal title may exist to the land within TFL 19. The MMFN are not currently engaged in a treaty process with the province.

From my review of the consultation summary, consideration of the information presented to me, and discussions with staff, I conclude that reasonable efforts were made by the Campbell River Forest District and the licensee to inform First Nations about the timber supply review and engage them in consultation regarding their aboriginal interests and how these interests may be affected by this AAC determination. The preliminary assessment included a review of information regarding First Nations' aboriginal interests available to MFR, and an assessment of potential impacts my AAC decision may have on those interests or cultural use. The findings from the MFR preliminary assessment were referenced in letters during the consultation process. In consideration of the information, I believe that the level of consultation for the timber supply review of TFL 19 has been adequate. The scope of consultation reflected and was commensurate with MFR's assessment of the aboriginal interests asserted by the relevant First Nations within TFL 19. Furthermore, opportunities were provided to all First Nations to share their concerns related to specific aboriginal interests that may be impacted by this decision.

If new information regarding First Nations' aboriginal interests becomes available that significantly varies from the information that was available for this determination and that may affect timber supply, I am prepared to revisit this determination sooner than the 10 years required by legislation.

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

Short-term and long-term implications

*- alternative rates of harvest*

In addition to the base case, the licensee provided two alternative harvest flows. These represent trade-offs between short- and mid-term harvest rates.

I have reviewed the alternative harvest rates modelled by the licensee and have taken that information into consideration in my determination.

**(c) repealed [2003-31-2 (B.C. Reg. 401/2003)]**

This section of the *Forest Act* has been repealed [2003-31-2 (B.C. Reg. 401/2003)].

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

Economic and social objectives

*- Minister's letter*

The Minister of Forests and Range has expressed the economic and social objectives of the Crown for the province in a letter to the chief forester, dated July 4, 2006 (attached as Appendix 3). The letter stresses the importance of a stable timber supply to maintain a competitive and sustainable forest industry while being mindful of other forest values. In respect of this, in the base case projection and in all of the alternative harvest flow projections with which

I have been provided for reference in this determination, a primary objective in the harvest flow has been to attain a stable, long-term harvest level where the growing stock also stabilizes. I have also considered with care the adequacy of the provisions made both in current practice, and assumed in the analyses, for maintaining a range of forest values.

I am therefore satisfied that this determination accords with the objectives of government as expressed by the Minister.

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

**As I indicated in Table 1, I accept the assumptions applied in the base case for this factor.**

**Reasons for decision**

In reaching my AAC determination for TFL 19, I have considered all of the factors required under Section 8 of the *Forest Act* and I have reasoned as follows.

The base case harvest forecast projected an initial harvest level of 870 000 cubic metres per year for five years followed by a step down to 753 000 cubic metres per year. Over the first 25 years in the base case forecast, the harvest level declines by seven percent each five-year period to a low of 561 700 cubic metres per year. This harvest level, once attained, is maintained for 45 years, before increasing by six percent, to 595 700 cubic metres per year at year 71. It is maintained for 15 years at that level and then at year 86, the harvest level increases by nine percent to the long-term level of 650 500 cubic metres per year. I am mindful the base case harvest flow reflects a regulated transition from the current AAC to a mid-term level that is 34 percent lower than the current AAC.

I am satisfied that the assumptions applied in the base case forecast for the majority of the factors applicable to TFL 19 were appropriate. In this section, I have summarized my consideration of those factors for which I deem it necessary to further take into account impacts on the timber supply as projected in the base case forecast.

In determining an AAC for TFL 19, I have identified a number of factors which, considered separately, indicate the timber supply may be either greater than or less than what was projected in the base case. Some of these factors can be readily quantified and their impact on the harvest level assessed with reliability. Others may influence timber supply by adding an element of risk or uncertainty to the decision, but cannot be reliably quantified at this time.

I have identified the following factors in my considerations as indicating that the timber supply projected in the base case has been **overestimated**:

- *Minimum merchantability standards*: Stands in the non-conventional areas covering 12 percent of the THLB will likely not reach a harvestable condition at the volumes and ages assumed in the base case. While the licensee restricted harvesting on the non-conventional land base in the model to 50 000 cubic metres per year, which likely reduces the risk to the timber supply, I consider inclusion of these areas represents an unquantified overestimation in the base case timber supply;
- *Forest retention (wildlife tree patches and riparian management zones)*: Forest retention levels are higher than reflected in the base case for wildlife tree patches, riparian management zones, as well as, implementation of the licensee's *Forest Strategy*. This results in an overestimation in the short-term timber supply of up to four percent;

- *First Nations' archaeological sites, culturally modified trees and cultural heritage resource values:* The number, size, type and location of archaeological sites is currently uncertain; however, due to the high number of known sites I concluded that it is likely these sites are under-represented in the base case. This represents an unquantifiable overestimation of timber supply in the base case timber supply projection.

I have identified the following two factors that indicate the timber supply projected in the base case may have been **underestimated**:

- *Coastal log grades:* The current provincial inventory does not account for the volume potentially available from dead but merchantable trees. These trees are now charged to the AAC and must therefore be accounted for in AAC determinations. I concluded short-term timber supply has potentially been underestimated by two percent;
- *Site productivity:* Site productivity for immature natural stands was derived using heights and ages from phase II of the VRI. Based on site productivity information from phase I of the VRI and from adjacent management units, I concluded that site productivity was underestimated for existing natural immature stands, covering 13 percent of the THLB. As a result, mid-term timber supply was underestimated by an unknown amount.

Having considered the information above, I reason as follows. The base case for TFL 19 projects a declining timber supply for the first 25 years of the forecast, after which a relatively stable mid-term level is reached that is 34 percent lower than the current AAC. The analysis for this timber supply review was completed several years ago; therefore, we are near the second five-year period when the timber supply is projected to decline by 13 percent to 753 000 cubic metres per year. As I am setting the AAC for a maximum of 10 years, I have also considered the subsequent seven percent decline projected to 699 800 cubic metres per year in the third five-year period of the forecast. The average of these two harvest levels is about 730 000 cubic metres per year, and I have used this level as the new base line for assessing further uncertainties and risk. Only two of the factors discussed above suggest the timber supply may be underestimated by the base case projection. The potential increase in volume attributable to dead standing trees may support the short-term timber supply; however, this is subject to some uncertainty. Underestimations in site productivity of existing natural immature stands suggest that mid-term timber supply could be greater than modelled in the base case. However, a number of factors – merchantability standards, retention for wildlife trees and cultural heritage resources – suggest the base case may overestimate timber supply.

While known upward pressures do not entirely offset the downward pressures, I believe the revised baseline reduces the risk from these uncertainties. In consideration of this, and the projections that indicate harvest levels must decline on TFL 19 in a series of step downs to the lower mid-term level, I reason that it is appropriate at this time to reduce the AAC of TFL 19. I determine an appropriate harvest level for TFL 19 at this time is 730 000 cubic metres per year, a level that is approximately 15 percent less than the current AAC. I believe this level represents a reasonable accounting of the uncertainties associated with the assumptions applied in the short- to mid-term timber supply forecasts and the immediate need to begin the step down transition to reach the long-term harvest level over the next several decades.

## **Determination**

I have considered and reviewed all of the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next decade, and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in the TFL by establishing an AAC of 730 000 cubic metres.

This determination is effective August 10, 2010 and will remain in effect until a new AAC is determined, which must take place within a decade after the effective date of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then I am prepared to revisit this determination sooner than the 10 years required by legislation.

### **Implementation**

In the period following this decision and leading to the subsequent determination, I encourage the licensee staff to undertake the tasks noted below. I recognize that the licensee's ability to undertake these projects is dependent on available staff resource time and funding. However, these projects are important to help reduce the level of risk and uncertainty associated with key factors affecting timber supply on TFL 19. I instruct the licensee to:

- continue to monitor harvesting performance in the non-conventional areas;
- revisit the Phase II (ground sampling) plots and, in conjunction with Forest Analysis and Inventory Branch staff, develop a strategy for improving the quality of the inventory;
- complete the terrestrial ecosystem mapping (TEM) accuracy assessment or an equivalent quality assessment;
- review and update the *Forest Strategy*;
- work with First Nations and MFR staff to develop a cedar strategy to provide guidance when considering First Nations cedar interests and better assess the available supply of cedar;
- continue to monitor actual retention levels applied so they can be improved for the next timber supply review.



Melanie Boyce, RPF  
Deputy Chief Forester

August 10, 2010





## **Appendix 1: Section 8 of the *Forest Act***

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, Consolidated to December 30, 2009, reads as follows:

### Allowable annual cut

- 8** (1) The chief forester must determine an allowable annual cut at least once every 10 years after the date of the last determination, for
- (a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest agreement areas and woodlot licence areas, and
  - (b) each tree farm licence area.
- (2) If the minister
- (a) makes an order under section 7 (b) respecting a timber supply area, or
  - (b) amends or enters into a tree farm licence to accomplish a result set out under section 39 (2) or (3),
- the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area
- (c) within 10 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 10 years after the date of the last determination.
- (3) If
- (a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and
  - (b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,
- the chief forester must determine an allowable annual cut at least once every 10 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).
- (3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was

determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

(a) by written order may postpone the next determination under subsection (1) to a date that is up to 15 years after the date of the relevant last determination, and

(b) must give written reasons for the postponement.

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

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

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

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

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

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

(a.1) different areas of Crown land within a timber supply area or tree farm licence area, and

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

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

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

(7) The regional manager or the regional manager's designate must determine an allowable annual cut for each community forest agreement area, in accordance with

- (a) the community forest agreement, and
- (b) any directions of the chief forester.

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

- (a) the rate of timber production that may be sustained on the area, taking into account
  - (i) the composition of the forest and its expected rate of growth on the area,
  - (ii) the expected time that it will take the forest to become re-established on the area following denudation,
  - (iii) silviculture treatments to be applied to the area,
  - (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,
  - (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production, and
  - (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber,
- (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,
- (c) [Repealed 2003-31-2.]
- (d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia, and
- (e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

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

Section 4 of the *Ministry of Forests and Range Act* (consolidated 2006) reads as follows:

### **Purposes and functions of ministry**

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

### **Document attached:**

## **Appendix 3: Minister's letter of July 4, 2006**



JUL 04 2006

Jim Snetsinger  
Chief Forester  
Ministry of Forests and Range  
3<sup>rd</sup> Floor, 1520 Blanshard Street  
Victoria, British Columbia  
V8W 3C8

Dear Jim:

**Re: Economic and Social Objectives of the Crown**

The *Forest Act* gives you the responsibility for determining Allowable Annual Cuts-decisions with significant implications for the province's economy, communities and environment. This letter outlines the economic and social objectives of the Crown you should consider in determining Allowable Annual Cuts, as required by Section 8 of the *Forest Act*. This letter replaces the July 28, 1994 letter expressing the economic and social objectives of the Crown, and the February 26, 1996 letter expressing the Crown's economic and social objectives for visual resources. The government's objective for visual quality is now stated in the Forest Practices and Planning Regulation of the *Forest and Range Practices Act*.

Two of this government's goals are to create more jobs per capita than anywhere in Canada and to lead the world in sustainable environmental management. The Ministry of Forests and Range supports these objectives through its own goals of sustainable forest and range resources and benefits. In making Allowable Annual Cut determinations, I ask that you consider the importance of a stable timber supply in maintaining a competitive and sustainable forest industry, while being mindful of other forest values.

The interior of British Columbia is in the midst of an unprecedented mountain pine beetle outbreak. Government's objectives for management of the infestation are contained in British Columbia's Mountain Pine Beetle Action Plan. Of particular relevance to Allowable Annual Cut determinations are the objectives of encouraging long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land use plans.

**Minister of  
Forests and Range  
and Minister Responsible  
for Housing**

Office of the  
Minister

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**Jim Snetsinger**

To assist the province and affected communities in planning their responses to the beetle infestation, it would be best to have realistic assessments of timber volumes that can be utilized economically. Therefore, in determining the best rate of harvest to capture the economic value from beetle-killed timber, I ask that you examine factors that affect the demand for such timber and products manufactured from it, the time period over which it can be utilized, and consider ways to maintain or enhance the mid-term timber supply.

The coast of British Columbia is experiencing a period of significant change and transition. In making Allowable Annual Cut determinations I urge you to consider the nature of timber supply that can contribute to a sustainable coast forest industry, while reflecting decisions made in land and resource management plans.

You should also consider important local social and economic objectives expressed by the public during the Timber Supply Review process, where these are consistent with the government's broader objectives as well as any relevant information received from First Nations.

Sincerely yours,

A handwritten signature in black ink, appearing to be 'Rich Coleman', with a long horizontal stroke extending to the right.

**Rich Coleman**  
Minister