

**BRITISH COLUMBIA
MINISTRY OF FORESTS, LANDS AND
NATURAL RESOURCE OPERATIONS**

Tree Farm Licence 49

held by
Tolko Industries Ltd.

Rationale for Allowable Annual Cut (AAC) Determination

Effective February 24, 2012

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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) 49. 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 Tree Farm Licences (TFLs). Section 8 of the *Act* is reproduced in full as Appendix 1 of this document.

Description of the TFL

Tree Farm Licence 49, held by Tolko Industries Ltd. (Tolko, or the licensee), is located west of Okanagan Lake near the communities of Kelowna, Vernon, and Armstrong. It is administered from the Okanagan Shuswap District office of the Ministry of Forests, Lands and Natural Resource Operations (FLNR) in Vernon. Management on this licence has been ongoing for almost 60 years. The TFL has three distinctive blocks (called A, B, and C). Block A is situated west of Okanagan Lake to the height of land between the Okanagan and Nicola drainages, and north of Lambly Creek, to the Naswhito Creek drainage. Block B adjoins the north west portion of Block A, runs west of Bouleau Lake, bounded on the south by the Salmon River drainage, to Salmon Lake, and runs north to Monte Lake and west to the Monte Hills and Weyman Creek drainage. Block C is separate from the rest of the TFL. It is located north of Falkland and east of Pillar Lake towards the Salmon River. The total land base of the TFL is 141 975 hectares, of which 132 967 hectares are considered to be productive forest. The current timber harvesting land base (THLB) for TFL 49 is 116 165 hectares, or 82 percent of the total TFL area.

The terrain varies from lowland to mountainous. The licensee estimates that approximately five percent of the THLB consists of slopes greater than 50 percent and approximately 12 percent consists of slopes between 35 percent and 50 percent.

The TFL is ecologically diverse with five biogeoclimatic zones. The Interior Douglas-fir (IDF) zone at 37 percent, the Montane Spruce (MS) zone at 34 percent, and the Engelmann Spruce – Subalpine Fir zone at 24 percent, collectively represent about 95 percent of the TFL land base. About four percent of the TFL is in the Interior Cedar – Hemlock (ICH) zone and less than one percent is in the Ponderosa Pine (PP) zone. The four most common tree species in the TFL include lodgepole pine, Douglas-fir, spruce, and subalpine fir. Other coniferous tree species in the TFL include ponderosa pine, western redcedar, and larch. Deciduous species include aspen, birch, and cottonwood.

The thirteen First Nations with traditional territory covering all or part of TFL 49 include Adams Lake Indian Band, Coldwater Indian Band, Cook's Ferry Indian Band, Little Shuswap Indian Band, Lower Nicola Indian Band, Lower Similkameen Indian Band, Lytton First Nation, Neskonlith Indian Band, Okanagan Indian Band, Penticton Indian Band, Splotsin Indian Band, Upper Nicola Indian Band, and Westbank First Nation.

History of the AAC

In 1988 TFL 9, TFL 16 and TFL 32 were consolidated and replaced with TFL 49. The new TFL was issued to Crown Forest Industries Ltd. with an AAC of 380 000 cubic metres. The AAC remained unchanged at 380 000 cubic metres through two AAC determinations in 1994 and 1998. In 2002 the AAC determination was postponed under Section 8(3.1) of the *Forest Act* until the most recent AAC for TFL 49 was determined, effective December 5, 2005 at 580 000 cubic

metres. At that time the deputy chief forester increased the AAC by 200 000 cubic metres in order to allow for the salvage of pine trees killed in the mountain pine beetle epidemic.

The TFL was transferred to Riverside Forest Products Limited in 1992, and in November 2004 Tolko purchased Riverside Forest Products Limited.

The portion of the AAC currently assigned to British Columbia Timber Sales is 36 905 cubic metres.

New AAC determination

Effective February 24, 2012 the new AAC for TFL 49 is 330 000 cubic metres, of which 204 000 cubic metres are attributed, under Section 8(5)(a.1) of the *Forest Act*, to that portion of the TFL outside of the Browns Creek litigation area. 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 49 include references listed in the licensee's Information Package and Timber Supply Analysis Report and the following:

- Existing Stand Yields, accepted by Forest Analysis and Inventory Branch, through review of 2009 Phase II Adjustment;
- Managed Stand Yields/Site Index, accepted by Forest Analysis and Inventory Branch, October 26, 2011;
- Tree Farm Licence 49 Information Package, accepted by Forest Analysis and Inventory Branch, January 4, 2011;
- Tree Farm Licence 49 Timber Supply Analysis, submitted November 14, 2011, accepted by Forest Analysis and Inventory Branch February 2, 2012;
- Brown's Creek Contribution to TFL 49 Timber Supply, Tolko Industries Ltd., May 18, 2011;
- Draft TFL 49 Management Plan No. 5, Tolko Industries Ltd., July 4, 2011, pending chief forester approval;
- Public input summaries, part of draft TFL 49 Management Plan No. 5, July 4, 2011;
- Estimating the Non Productive Losses Associated with Roads, Trails and Landings in TFL 49, Forsite, December 2009;
- Shelf-life Curve Update, Timberline, May 2009;
- Forest Stewardship Plan for Tolko Industries Ltd. Okanagan Regional Woodlands, Stella-Jones Canada Inc. (Monashee Area), Selkirk Timber Company, Gorman Bros. Lumber Ltd., Westbank First Nation, Little Shuswap Indian Band, Upper Nicola Indian Band and the Neskonlith Indian Band, effective February 28, 2007 to February 27, 2012;
- Okanagan-Shuswap Land and Resource Management Plan (LRMP) approved by government in January of 2001;
- Order of the Minister of Agriculture and Lands Establishing Objectives set by Government in the Area covered by the Okanagan-Shuswap Land and Resource Management Plan in the Okanagan-Shuswap Forest District, effective March 1, 2007;

- Government Actions Regulation (GAR) Order Ungulate Winter Range #U-8-001-Okanagan TSA (mule deer), 2006;
- GAR Order Ungulate Winter Range #U-8-005-Okanagan TSA (mountain goat), 2006;
- GAR Order Ungulate Winter Range #U-8-006-Okanagan TSA (moose), 2006;
- Tolko's Certification Schemes under CSA Z809 and ISO 14001;
- Predictive Ecosystem Mapping (PEM) for TFL 49, approved by Research Branch, June 2003;
- TFL 49 Retention Plan for Tolko Industries Limited, Okanagan Regional Woodlands, February 2006;
- Okanagan Regional Woodlands (Tolko) Variable Retention Field Guide, Stand Level Approaches to Conservation of Biodiversity, December 2005;
- *Tree Farm Licence 49 Rationale for Allowable Annual Cut Determination*; December 5, 2005;
- *Forest and Range Practices Act – Regulations and amendments*, current to February 8, 2012;
- *Forestry Revitalization Act*, current to February 8, 2012;
- *Forest Act*, current to February 8, 2012;
- *Ministry of Forests and Range Act*, current to February 8, 2012;
- *Allowable Annual Cut Administration Regulation*, with amendments to June 9, 2011;
- *Forest Practices Code of British Columbia Act* and amendments and guidebooks, January 31, 2004;
- Affidavits from HMTQ v Chief Dan Wilson, including
 - Dr. Brian Guy PhD, Hydrologist, Summit Environmental Consultants Ltd., April 27, 2007;
- Affidavits from Tolko v ONA, including
 - Dr. David Pokotylo, January 30, 2009;
- Procedures for factoring visual resources into timber supply analyses, Ministry of Forests, Lands, and Natural Resource Operations, 1998 and the update bulletin, Modelling Visuals in TSR III;
- Designated Community Watersheds, Ministry of Environment;
- Letter from the Minister of Forests and Range (now the Ministry of Forests, Lands and Natural Resource Operations) to the chief forester stating the economic and social objectives of the Crown, July 4, 2006;
- Tree Farm Licence 49 Management Plan #5 and Timber Supply Review: Consultation Record, Okanagan Shuswap District, January 23, 2012;
- Meeting between Chief Forester Jim Snetsinger and Okanagan Indian Band Chief Byron Lewis and Council in Vernon, September 27, 2011;
- Meeting between Chief Forester Jim Snetsinger and representatives from Tolko Industries Limited in Vernon, November 30, 2011;

- Technical review and evaluation of current operating conditions on TFL 49 through comprehensive discussions with staff from the Ministry of Forests, Lands and Natural Resource Operations and the Ministry of Environment, including the AAC determination meeting held in Victoria, B.C. on December 14, 2011 and December 19, 2011.

Role and limitations of the technical information used

Section 8 of the *Forest Act* requires the chief forester, in determining AACs, to consider biophysical, social and economic information. Most of the technical information used in determinations is in the form of a timber supply analysis and its inputs of inventory and growth and yield data. These are concerned primarily with biophysical factors – such as the rate of timber growth and the definition of the land base considered available for timber harvesting – and with management practices.

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 49, 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

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.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, I intend to 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 I take this uncertainty into account to the extent possible in context of the best available information.

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 and are not considered to contribute any harvestable volume to the timber supply in AAC determinations, although they may contribute indirectly by providing forest cover to help in meeting 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 judgment 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. Specific concerns identified by First Nations in relation to their aboriginal interests within the TFL are addressed in various sections of this rationale.

The AAC that I determine should not be construed as limiting the Crown's obligations under court 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 49. It is also independent of any decisions by the Minister of Forests, Lands and Natural Resource Operations with respect to subsequent allocation of wood supply.

Overall, in making AAC determinations, I am mindful of my obligation as a steward of the forested land of British Columbia, of the mandate of the Ministry of Forests, Lands and Natural Resource Operations (formerly 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)*.

The role of the base case

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

For 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 model, a series of timber supply forecasts can be produced to reflect 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 it represents only one in a number of theoretical forecasts, and because it incorporates information about which there may be some uncertainty, the base case forecast 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 model used to generate it.

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

These adjustments are made on the basis of informed judgment 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 judgment 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. Judgments 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 November 2011 timber supply analysis report for TFL 49 was prepared for the licensee by the TECO Natural Resource Group. The timber supply analysis was performed using Patchworks, a spatially explicit harvest scheduling optimization model developed by Spatial Planning Systems in Ontario. The forecasts from this timber supply model were reviewed by ministry staff, who advised me about the function of the model, and any associated implications with the harvest projections.

For the base case, the analyst attempted to identify a harvest flow that counterbalanced the harvesting of mountain pine beetle infested stands in the short term with minimizing the decline to the mid-term harvest level. Other objectives included achieving the maximum possible long-term, even-flow supply consistent with a stable growing forest.

In the base case, the initial harvest level of 376 500 cubic metres per year was maintained for 10 years before the forecast declined to the mid-term harvest level of 230 500 cubic metres per year for the next 20 years. The harvest level then increased in steps of approximately 10 percent per five-year period from year 31 to year 60 when the non-declining, long-term harvest level of 417 500 cubic metres per year was attained.

The 2011 timber supply analysis report also includes a number of sensitivity analyses conducted to assess the potential implications for timber supply arising from uncertainty in data assumptions and estimates. The licensee also provided an addendum to the timber supply analysis titled *Brown's Creek Contribution to TFL 49 Timber Supply*. The sensitivity analyses and the addendum have been of assistance to me in considering the factors leading to my determination.

Having reviewed in detail the assumptions and methodology incorporated in the base case and addendum, as well as the model output, including species distribution over time, growing stock projections by age class over time, average age, area, and volume harvested annually, and other factors as described in my considerations below, for this determination I am satisfied that the base case harvest forecast and the sensitivity analyses have provided suitable bases for my assessment of the timber supply for TFL 49.

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

I have reviewed the information for all of the factors required to be considered 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 in Table 1.

Table 1. List of accepted factors

Forest Act section and description	Factors accepted as modelled
8(8)(a)(i) Composition of the forest and its expected rate of growth	<ul style="list-style-type: none"> • BC mountain pine beetle model and shelf life • Parks and protected areas • Non-forest and non-productive • Existing roads and trails • Landings • Non-commercial brush • Recreation reserves • Non-merchantable forest types • Terrain and impediments to regeneration • Operability/harvest systems • Riparian reserves and management zones • Wildlife tree patches • Enhanced riparian reserves • Kelowna Dirt Bike Club • Crystal Mountain Ski Hill • Future roads and landings • Productivity assignments • Aggregation procedures • Natural stand yields • Existing and future managed stand yields • Minimum harvestable ages • Harvest rules and harvest flow objectives
8(8)(a)(ii) Expected time it will take the forest to become re-established following denudation	<ul style="list-style-type: none"> • Regeneration delay • Not satisfactorily restocked
8(8)(a)(iii) Silvicultural treatments to be applied	<ul style="list-style-type: none"> • Silvicultural systems • Regeneration
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste and breakage	<ul style="list-style-type: none"> • Utilization standards • Decay, waste and breakage
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	<ul style="list-style-type: none"> • Non-timber resource inventories • Adjacency • Watershed management • Wildlife management <ul style="list-style-type: none"> ○ Mule deer winter range ○ Bighorn sheep zone ○ Mountain goat ○ Moose winter range ○ Caribou habitat • Visual quality management • Identified wildlife • Stand-level biodiversity • Landscape-level biodiversity • Disturbances in the inoperable land base

Forest Act section and description	Factors accepted as modelled
8(8)(a)(vi) Any other information	<ul style="list-style-type: none"> • Harvest levels – cut control/harvest performance • Cultural heritage resources
8(8)(e) Abnormal infestations in and devastation of, and major salvage program planned for, timber on the area	<ul style="list-style-type: none"> • Non-recoverable losses

For other factors, where more uncertainty exists, or where public or First Nations' input indicates contention regarding the information used, modelling, or some other aspect under consideration, this rationale incorporates an explanation of how I considered the essential issues raised and the reasoning leading to my conclusions.

Factors requiring additional explanatory consideration

Section 8 (8)

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

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

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

In addition to the factors listed under this section in Table 1, I have also considered the following factor requiring comment or discussion.

- inventory

The vegetation resources inventory (VRI) for TFL 49 was one of the first VRI projects completed in B.C. Phase I, photo interpretation, was completed in 1996 and ground sample data for the Phase II adjustment was collected in 1999 and 2000. A second phase II adjustment was completed in 2009. The VRI was prepared for this timber supply analysis by updating it for harvesting and natural disturbances that have occurred to the end of 2009 and projecting forest growth to January 1, 2010. The overall result of the second phase II adjustment was a decrease of approximately 19 percent from the unadjusted phase I volume. The licensee recognizes the need for a revised phase I VRI but states that timing of this project is uncertain due to the current mountain pine beetle epidemic.

First Nations have expressed concerns that the inventory information used in the analysis is inaccurate and that this affects the validity of the results.

I have reviewed the available information and discussed it with FLNR staff. For this determination I find that the best available information was used for the base case. I encourage the licensee to follow through on its intention to conduct a new Phase I inventory for TFL 49, especially in view of the effects the mountain pine beetle epidemic likely has had on the forest cover of the TFL.

- interior log grades

On April 1, 2006 new log grades were implemented in the B.C. interior. Under the previous grade system, a log was assessed according to whether the tree it came from was alive or dead at the time of harvest. Prior to April 1, 2006 grade 3 endemic (the "normal" mortality observed in a mature stand), and grade 5 (dead tree with greater than 50 percent firmwood and has defects such

as twists, knots or heart rot) were not charged to the AAC if harvested. Under the new system, grades are based on the log's size and quality at the time it is scaled, or assessed, without regard to whether it was alive or dead at the time of harvest. Logs that were previously considered grade 3 endemic or grade 5 will now be charged to the AAC. This volume must now be considered in AAC determinations.

Estimates of timber volume in the base case did not include the dead logs that could potentially be used as sawlogs (dead potential) with the exception of dead logs killed by the current MPB epidemic. VRI phase II ground sample data, which is considered to be the best data source for these volumes, indicate dead potential volume is approximately 10.6 percent of the green volume for stands over 60 years of age within the TFL. Data from the harvest billing system for the period 1995 to 2004 (when taking dead logs to the mills was solely at the discretion of licensees) showed that grade 3 endemic and grade 5 totalled approximately six percent of the harvested volume.

Having considered the available information, I find it reasonable to assume that the harvest of dead potential volume will continue at about the same level as in the past and therefore the short- and medium-term timber supply projected in the base case has been underestimated by approximately six percent, and I account for this in '**Reasons for Decision**'.

- operational adjustment factors

In the *2005 Rationale for Allowable Annual Cut Determination for TFL 49* the deputy chief forester expressed his concern about the potential overestimation of managed stand yields stemming from the application of non-standard operational adjustment factors (OAF) and its effect on mid-term timber supply. He instructed the licensee to further examine and refine its OAF adjustments for this analysis. The standard provincial OAF values are 15 percent for OAF 1 and five percent for OAF 2.

In the base case the standard OAF 2 of five percent was used for existing and future managed stands. The same non-standard OAF 1 of 10 percent was applied that was applied for the 2005 determination. The licensee justified its application on the basis that the TFL 49 VRI was mapped to a finer resolution, with non-productive stands mapped to a minimum of 0.5 hectares or less compared to a typical minimum of two hectares in other inventories. This rationale was previously accepted to be reasonable but it is not an approach that is widely used in other management units with inventories mapped to the same VRI standards. FLNR has initiated a project titled *A Framework for Implementing Second Growth Stand Monitoring in British Columbia*, and it will provide information that can be used to check the accuracy of yield projections used in timber supply analyses, including OAFs. For this determination I consider the assumed OAF 1 to be adequate, however I encourage the licensee to consider developing a monitoring strategy that will, over time, confirm the yields that can be expected from managed stands on TFL 49.

Section 8 (8) (a) (ii) the expected time that it will take the forest to become re-established on the area following denudation:

Table 1 lists each of the factors I have considered under this section for which I agree with the published information respecting current practice and with the modelling as incorporated in the base case. No factors considered under this section require additional comment.

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

In addition to the factors listed under this section in Table 1 above, I have also considered the following factor, which requires additional comment.

- genetic gains

In the base case genetic gains were applied for lodgepole pine, spruce and Douglas-fir. For stands that were established over the last 10 years a 10-percent gain was applied for lodgepole pine; eight percent for spruce; and 24 percent for Douglas-fir. Future managed stands were modelled assuming genetic gains projected to be realized 10 years from now. The gains applied were 13 percent for lodgepole pine; 16 percent for spruce; and 30 percent for Douglas-fir.

On review of the assumed genetic gains by FAIB staff, it was found that the gains applied for stands less than 10 years old were not adjusted to account for seed availability which was limited to approximately 18 percent for lodgepole pine and zero percent for Douglas-fir. As a result, yields projected for lodgepole pine and Douglas-fir stands aged from 0 to 10 years were overestimated in the base case. In addition, no planting stock will be available with the genetic gains assumed for future regenerated stands for the next 10 years. As a result, the yields projected for stands regenerated in the first 10 years of the harvest forecast are also overestimated. However, the stands affected by these overestimates only contribute to the timber supply around the end of the transition from the mid-term to the long-term in the forecast. For this determination I consider the genetic gain assumptions applied in the base case to represent a small overestimate in timber supply around the time of the transition from the mid- to long-term harvest levels and I will discuss this further in '**Reasons for Decision**'.

Section 8 (8) (a) (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:

Table 1 lists each of the factors I have considered under this section for which I agree with the published information respecting current practice and with the modelling as incorporated in the base case. No factors considered under this section require additional comment.

Section 8 (8) (a) (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:

In addition to the factors listed under this section in Table 1 above, I have also considered the following factor, which requires additional comment.

- identified wildlife

There are no existing or proposed Wildlife Habitat Areas (WHA) in the TFL at this time. Badger and Flammulated owl are known to be within the TFL. WHAs have been established for Badger and Flammulated owl in other parts of the province so there is potential that future WHAs may be established within the TFL. Identified wildlife was modelled appropriately at this time. Any potential downward effect from the future establishment of WHAs will be small and will be captured in future timber supply reviews.

Section 8 (8) (a) (vi) any other information that, in the chief forester's opinion, relates to the capability of the area to produce timber;

- First Nations considerations

The Crown has a duty to consult with, and accommodate if necessary, those First Nations for whom it has knowledge of asserted aboriginal rights and title (aboriginal interests) that may be impacted by a decision, including strategic-level decisions such as AAC determinations. I must therefore consider information arising from the consultation process with First Nations respecting aboriginal interests that may be affected by my AAC determination. As well, I will consider

other relevant information available to the ministry regarding aboriginal interests, including information gathered during other consultation processes.

The traditional territories of thirteen First Nations cover all or part of TFL 49. Of these First Nations, the Okanagan Indian Band, Penticton Indian Band, Upper Nicola Indian Band, Lower Similkameen Indian Band, and Westbank First Nation are members of the Okanagan Nation Alliance (Sylix Nation). The Adams Lake Indian Band, Little Shuswap Indian Band, Neskonlith Indian Band, and Splatsin Indian Band are members of the Shuswap Nation Tribal Council (Secwepemc Nation). The Lytton First Nation is a member of the Nlaka'pamux Nation Tribal Council. The Coldwater and Cook's Ferry Indian Bands are members of the Nicola Tribal Association. They are also represented by the Esh-kn-am Cultural Resource Management Services Joint Venture who has the authority to consult and respond to information sharing from proponents on behalf of Coldwater and Cook's Ferry Indian Bands. The Lower Nicola Indian Band is not affiliated with a tribal council or other First Nations organization.

All of the First Nations, excluding the Lytton First Nation, Upper Nicola Indian Band and Splatsin First Nation, have in place an Interim Measures Agreement (IMA), Forest Consultation and Revenue Sharing Agreement (FCRSA) or a Forest and Range Opportunities agreement (FRO). The IMA and FRO provide for revenue sharing and forest tenure opportunities, and contain a framework for establishing consultation processes to guide consultation on administrative decisions, including AAC determinations and approval of TFL management plans. However, no consultation processes have yet been developed for any of these agreements. As a result, consultation was conducted in accordance with the consultation spectrum as outlined in the *Haida* decision.

The Province recently introduced the new FCRSA and negotiations are ongoing with the First Nations to replace expired IMA and FRO agreements. FCRSAs provide for revenue sharing and they support capacity so that First Nations may participate in consultation initiated by the Province. FCRSAs also contain provisions for a consultation process for operational and administrative decisions and include an initial annual list of decisions and suggested level of consultation that the parties agree to prior to signing the agreement. The consultation process includes developing an annual list of decisions that are expected to be made during the year along with agreed upon levels of consultation for each of the decision. At the time of this AAC determination, the Little Shuswap Indian Band, the Lower Similkameen Indian Band, and the Westbank First Nation have entered into FCRSAs. The initial annual list suggested a normal level of consultation for TFL AAC determinations.

Prior to beginning the consultation process, an initial review of existing information regarding the strength of the First Nations aboriginal interests and the potential impact this AAC determination may have on these interests was undertaken to provide a suggested level of consultation.

As part of the consultation process, preliminary assessments were undertaken by district staff which considered existing information and information provided by First Nations regarding the strength of aboriginal interests and the potential impact this decision will have on these interests. Based on these assessments, the consultation undertaken for the First Nations belonging to the Shuswap Nation Tribal Council was at the normal level. For the First Nations in the Okanagan Nation Alliance the level of consultation undertaken was also at the normal level, except for the Penticton and Lower Similkameen Indian Bands. These two Bands assert the Okanagan Nation Alliance boundary as their traditional territories. Historical ethnographic information shows these two First Nations traditional territories do not overlap with the TFL 49 area and therefore district staff considered the appropriate level of consultation to be between notification and normal. The level of consultation undertaken for the First Nations in the Nlaka'pamux Tribal Nation Council

and for the Lower Nicola Indian Band, as well as for the two Indian Bands represented by the Esh-kn-am Cultural Resource Management Services Joint Venture was notification.

The Okanagan Nation Alliance, Nlaka'pamux Nation Tribal Council, Shuswap Nation Tribal Council, Nicola Tribal Association and Esh-kn-am Cultural Resource Management Services Joint Venture were also notified that the AAC determination was pending.

First Nations in the Okanagan Shuswap District hold a number of forest tenures including woodlot licenses, community forest agreements, non-replaceable forest licenses, MPB agreements, and grazing licenses. Tolko has service agreements with six bands to review information-sharing referrals for planned new blocks and roads.

The First Nations consultation process was comprised of three main phases of engagement:

- Information sharing completed by Tolko at the onset of the draft management plan preparation process;
- The release of the information package, draft management plan and analysis report provided by Tolko; and
- The Crown's consultation process.

On January 22, 2010 the licensee initiated information sharing regarding the draft management plan and timber supply review for TFL 49 in letters to the Adams Lake Indian Band, Little Shuswap Indian Band, Neskonlith Indian Band, Okanagan Indian Band, Splitsin Indian Band, Upper Nicola Indian Band, Westbank First Nation, and the Okanagan Nation Alliance. In the letters Tolko described the requirement for it to prepare a new management plan for TFL 49. Tolko also described the information a management plan must contain and requested input regarding the First Nation's concerns or aboriginal interests associated with forest management within TFL 49. Tolko sent another letter to these First Nations on May 26, 2010 advising that the timber supply review schedule had been extended. On July 5, 2010 Tolko sent a letter along with the analysis report and draft management plan to these First Nations.

After the licensee had sent this correspondence, it was informed by FLNR staff that several First Nations had updated their traditional territory boundaries, and as a result, several more First Nations' territories overlapped TFL 49. On July 6, 2010 Tolko sent a letter that shared information about their draft management plan and timber supply review to the Lower Nicola Indian Band, Lytton First Nation, Cook's Ferry Indian Band, Nicola Tribal Association, Esh-kn-am Cultural Resource Management Services Joint Venture, and Nlaka'pamux Nation Tribal Council. Three First Nations, Lower Similkameen, Coldwater, and Penticton Indian Bands were excluded from the licensee's information sharing process due to an oversight, however these First Nations were consulted by the Province and were provided the draft management plan, information package and timber supply analysis report.

On July 27, 2010 the Okanagan Shuswap District sent an initial consultation letter to the Adams Lake Indian Band, Little Shuswap Indian Band, Lower Nicola Indian Band, Lower Similkameen Indian Band, Lytton First Nation, Neskonlith Indian Band, Okanagan Indian Band, Penticton Indian Band, Splitsin Indian Band, Upper Nicola Indian Band, Westbank First Nation, the Okanagan Nation Alliance, Nlaka'pamux Nation Tribal Council, Nicola Tribal Association, and Esh-kn-am Cultural Resource Management Services Joint Venture. The letter provided information about the timber supply review and requested the First Nations to inform the chief forester about their aboriginal interests that could be impacted by the AAC determination. The letter also provided information regarding the Crown's initial understanding of the strength of aboriginal interests, the potential impact of the decision on these interests and the suggested

level of consultation. On August 29, 2011 a follow-up letter was sent from the Okanagan Shuswap District to all of these First Nations.

On September 23, 2011 the Okanagan Indian Band wrote a letter to the chief forester expressing concerns about the TFL 49 timber supply analysis and identified various concerns they would like to discuss at an upcoming meeting with him. These concerns included the Okanagan's right to harvest timber for domestic purposes, the presence of archaeological evidence and cultural heritage resources in the watersheds above the Okanagan Indian Band's reserve, and the desire to have these watersheds designated as community watersheds.

On September 27, 2011 the chief forester met with the Okanagan Indian Band and discussed these concerns. The Okanagan indicated that equivalent clearcut area standards are being exceeded in some drainages and that they are concerned that, as a result, the creek beds feeding into the reserve lands are drying up and there is insufficient water should every member exercise their water allocation on the reserve land. The chief forester committed to asking Tolko about the hydrological assessments they had conducted for TFL 49. This discussion occurred with Tolko and the outcome of this discussion is further described below.

The chief forester wrote to the Okanagan Indian Band on November 17, 2011 as a follow-up to their meeting, acknowledging that he would consider in his AAC determination domestic timber harvesting, hydrological assessments, and archaeological resources as identified in a report by Dr. David Pokotylo, Associate Professor of Archaeology at the University of British Columbia. Dr. Pokotylo's report and affidavit were provided to the chief forester by the Okanagan Indian Band with their letter of September 23, 2011.

Tolko met with the Splatins First Nation to discuss the management plan (including the timber supply analysis), operations in the TFL, and the archaeology process. Splatins First Nation identified aboriginal interests in Block C, with the areas around Bolean, Arthur and Spa Lakes being central to Splatins's interests. They expressed concern regarding the rate of cut and indicated modified management approaches may be needed. Their aboriginal interests include hunting, fishing, gathering plants for sustenance and medicines, and cultural ceremonies. As well, historical information indicates established camps, trails and cultural sites were also located in Block C. A second meeting was held and the planning regime including the retention plans and hydrological studies were discussed. The licensee indicated to me that Tolko has signed fee for service agreements with six First Nations, including the Splatins, for the review of new cutblocks and roads and their potential impacts on cultural heritage resources. I expect any concerns raised during these reviews are addressed at the operational level and to date none of them have required increasing constraints beyond those assumed in the base case.

There is active litigation (*HMTQ v Wilson*) which affects the Browns Creek area, covering approximately 30 000 hectares, within TFL 49. At present the licensee has legal authority to harvest in the Browns Creek litigation area (Browns Creek) but no harvesting has occurred since 2005 due to the Okanagan Indian Band's strong opposition to logging in this area. The licensee has no immediate plans to harvest in the litigation area and continues to work with government officials to address the concerns of the Okanagan Indian Band. The mountain pine beetle epidemic has killed a large portion of stands within the area. The base case assumes that dead pine salvage from Browns Creek makes a significant contribution to the short-term timber supply. During the first 10 years of the base case, on average 33 percent of the harvest is forecast to occur within Browns Creek.

In the course of the consultation process a number of concerns and aboriginal interests were expressed by First Nations as described below.

First Nations have indicated that high density road networks adversely affect their right to hunt and gather plants due to both site disturbance and increased public access. District staff informed me that this is an operational level issue that is addressed when reviewing the Forest Stewardship Plan and the licensee's proposals for block and road developments.

The Okanagan Indian Band raised a concern that some watersheds have equivalent clearcut areas (ECAs) above recommended levels. I discussed this issue with the licensee who indicated that in response to the MPB epidemic, they prepared a detailed retention plan in 2006 which provides strategies for managing retention within the 17 watersheds of the TFL. Tolko employed Dobson Engineering to assess the hydrological risk in twelve watersheds with a preponderance of pine leading stands. These hydrological impact assessments contributed to the retention plan. The intent of the retention plan was to address the MPB epidemic while ensuring local resource values were considered at both the stand- and landscape-levels. The plan looked at the following: areas of proposed salvage harvest of MPB infested timber (harvest polygons), areas of non-pine leading stands for deferred harvest (short-term retention) and areas of pine and other species to address local resource values (long-term retention).

I am aware that, in his Affidavit # 1, Dr. Brian Guy opines that the recommendations provided in the assessments conducted by Dobson Engineering Ltd. for the Nashwito and Whiteman Creek watersheds – both in the Browns Creek litigation area – do not provide sufficient evidence that the harvesting recommendations are optimal for either of these watersheds, noting that many factors are not addressed that should have been considered when forming the recommendations in the Dobson documents. I note that no harvesting has taken place in the Browns Creek litigation area since 2005 and that some hydrological recovery may have taken place during that time. If harvesting activities are again initiated in these drainages, I encourage the licensee to work with the Okanagan Indian Band to ensure any adverse hydrological impacts are minimized.

First Nations have expressed concern that the timber supply analysis fails to adequately consider cultural heritage resources and riparian buffers are inadequate to manage for these important resources. Riparian areas are associated with many First Nations interests including a variety of cultural heritage resources that are a focus of on-going traditional uses. Areas adjacent to water courses and water bodies are associated with high archaeological potential, travel routes, camping areas, sweat lodges, spiritual and ceremonial practices. As well, the First Nations indicated that the analysis failed to consider the traditional ecological knowledge of their elders. The licensee informed me that identified cultural heritage resources were being protected or conserved by avoidance strategies such as placing riparian reserves or a wildlife tree patch surrounding the resource.

First Nations expressed concerns regarding the general well being of wildlife populations, their sustenance needs, and the cultural connection aboriginal people have with wildlife species. Hunting and fishing remain key aboriginal interests and continue to provide food supplies for many aboriginal people. First Nations are concerned that roads constructed during logging create access to a wider user group, thereby increasing the impacts on wildlife and plants. The timber supply analysis accounted for habitat requirements of mule deer, big horn sheep, mountain goats and moose. The analysis also reflected other management practices such as leaving wildlife tree patches, retaining old growth for landscape-level biodiversity, and reserving riparian areas and unstable terrain. These areas also provide for wildlife habitat. First Nations highlighted the importance of berry production, and impacts to the abundance and distribution of berry plants caused by forest management practices such as clearcutting and historical fire prevention. Road construction and access management are strongly correlated with impacts to aboriginal gathering practices by increasing public access for commercial collection of non-timber forest products. First Nations are concerned that these factors will contribute to overall decline in the abundance, distribution, availability and productivity of berries.

Plants used for medicinal purposes are also a focus of concern for First Nations. Often medicinal plants are associated with spiritual or sacred areas. Some of these medicinal plants grow in riparian areas and high elevation areas. The timber supply analysis did not account for berry and medicinal plant production. However, to some extent, the management objectives modelled for riparian areas, terrain stability, and wildlife tree patches also provide for berry or traditional plant gathering. I am aware that the working relationship between the licensee and the First Nations provides an opportunity for these First Nations to comment if proposed cutblocks or road locations may disturb preferred plant and berry collection areas.

The Okanagan Nation Alliance and Okanagan Indian Band are concerned about how the chief forester will consider the aboriginal right to harvest wood for domestic purposes. District staff have heard that First Nations are looking to exercise their right to harvest timber that will be used in construction to alleviate housing shortages on reserve lands. However, to date, the district office has not received applications for a Free Use Permit associated with domestic timber harvesting rights. As provided for in Tree Farm Licence 49, each year during the term of the Licence the District Manager may dispose of a volume of timber not exceeding one-half of one percent of the AAC for such purposes. I conclude that the current licence provisions adequately provide for the anticipated harvesting activity that might occur should First Nations choose to exercise their domestic harvesting rights.

In previous AAC determinations, First Nations expressed concern about the quality of archaeological and Traditional Use Study (TUS) data used to inform the previous analyses and the decisions. The archaeological concerns extend to both recorded and unrecorded sites. District staff informed me of the initiatives undertaken between 2006 and 2010 to address or mitigate these concerns. The District was able to provide funding for a number of activities including an update of the Archaeological Overview Assessment (AOA) by Adams Lake Indian Band, and obtaining First Nations advice regarding options to implement AOAs and predictive modelling concepts. In partnership with Integrated Land Management Branch, Resource Inventory Standards Committee certified archaeological field crew training was provided to the Secwepmec communities and Sylix communities. Further funding provided training to the Splatins to support completion of their TUS. The Adams Lake, Neskonlith, Little Shuswap, and Upper Nicola Indian Bands have also completed TUSs. A trail inventory, including information regarding culturally modified trees (CMT) and an Archaeology Inventory Study in the Naswhito Creek watershed were completed in 2001 by the former licensee.

A number of archaeological sites were identified by Dr. David Pokotylo in an affidavit dated January 2009, which was referenced by the Okanagan Indian Band as evidence indicating areas of archaeological significance exist in the Browns Creek watershed. These sites primarily include CMTs, lithic scatter, historic cabins and trails. The affidavit did not provide information on the size of the sites.

The licensee informed me that it has been able to protect sites with identified cultural heritage resources through the placement of riparian management retention or wildlife tree retention areas. Since these sites were generally very small, the areas retained for other forest resource values and the flexibility in being able to choose the location for these areas provides reasonable opportunities to protect identified cultural heritage resources at the operational level. In addition, the licensee uses fee for service agreements with some of the bands to employ First Nations to conduct field reviews to identify potential cultural heritage resources and provide mitigation recommendations.

First Nations have expressed concern about the protection of culturally significant areas within TFL 49. District staff informed me that the areas surrounding Tahaetkun Mountain and Bouleau, Ghost and Drum Lakes are understood to be culturally significant to the Sylix communities. The

southern slope of Tahaetkun Mountain and Bouleau Lake areas are included in the Browns Creek litigation area and are partially overlapped by old-growth management areas (OGMAs) and lakeshore riparian reserves. Ghost and Drum Lakes also have lakeshore reserves in place. I was presented with maps showing some historical harvesting near the base of Tahaetkun Mountain but I am aware that the area was avoided before harvesting was halted in the Browns Creek litigation area, and this was not reflected in the base case. I note that in the 2005 AAC determination the deputy chief forester concluded that, given the size of the TFL, the contribution of the culturally significant areas to the base case timber supply likely does not present an undue risk to short-term timber supply on TFL 49. Having reviewed the information, I concur with this assessment for this determination, especially in light of the overlap of OGMAs and lakeshore riparian reserves with the culturally significant areas. When the actual area that requires some form of protection becomes known, it can be considered in future AAC determinations.

Based on my review of the information sharing and consultation processes followed, the aboriginal interest information available to FLNR staff, and the potential impact my decision may have on these interests, I believe that FLNR has engaged in consultation at an appropriate level on the consultation spectrum as outlined in the *Haida* decision. Furthermore, I note that district staff will continue to be available to meet and consult with First Nations on issues at the operational planning level.

No specific information was presented to me that quantifies the amount of wildlife or wildlife habitat, or area for the collection of berries or medicinal plants that is needed in addition to the assumptions made in the base case to address First Nations' hunting needs. The ungulate winter ranges on TFL 49 for mule deer, bighorn sheep, mountain goat, and moose, as well as the old-growth management areas, riparian reserve zones and areas excluded from the THLB for other reasons will serve to address this issue to some extent. While the hunting, fishing, berry and medicinal plant collection, and watershed concerns may affect on-the-ground operational layout and management, it appears generally that at this time the required management adjustments can be, and are being, made operationally, without incurring changes in the projected timber supply as currently analysed. If further clarity is gained on any of these issues, for instance through ongoing consultations or joint studies, this can be considered in future determinations.

Regarding the avoidance of harvesting in the Browns Creek area, I am concerned that, to meet cut control regulations, the remaining TFL area may be overharvested. I have therefore specified a portion of the AAC as being attributable to the Browns Creek litigation area under Section 8(5)(a.1) of the *Forest Act* and I will discuss this further under '**Reasons for Decision**'.

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 in 10 years, as required by legislation.

Section 8(8) (b) the short and long term implications to British Columbia of alternative rates of timber harvesting from the area,

- alternative rates of harvest

The base case initial harvest level was attained by optimizing mountain pine beetle salvage for the first 10 years while minimizing the decline to the mid-term harvest level. In addition to the base case, the licensee provided an alternative harvest flow which showed that discontinuing salvage harvesting increases mid-term timber supply by 10 500 cubic metres per year, but this is offset by a loss of 1 365 000 cubic metres of salvage volume over the first 10 years. This

indicates that the volume of other species remaining in mountain pine beetle salvage stands are not able to make a significant contribution to the mid-term timber supply if they are held beyond the shelf life of the pine.

In my determination I have been mindful of the viability of both of these projections in relation to the AAC I have determined.

Section 8(8) (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)].

Section 8(8) (d) the economic and social objectives of the government, as expressed by the minister, for the area, for the general region and for British Columbia;

- Minister's letter

The Minister of Forests and Range (now the Minister of Forests, Lands and Natural Resource Operations) 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). Two of the government's stated goals are to create more jobs per capita than anywhere else in Canada, and to lead the world in sustainable environmental management. The Minister asked for consideration, during AAC determinations, of the importance of a stable timber supply in maintaining a competitive and sustainable forest industry while being mindful of other forest values. In respect of this, in the base case projection and in the alternative harvest flow projections described above, 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.

Finally, the Minister suggested that the chief forester should consider the local social and economic objectives expressed by the public, and relevant information received from First Nations.

Seeking public input, the licensee advertised in the Kelowna, Vernon, and Kamloops newspapers inviting comments on the Information Package and draft Management Plan (including the timber supply analysis) during the week of February 26, 2010. Letters were also sent to the list of stakeholders that Tolko maintains for Forest Stewardship Plan referrals. Aside from the comments received from First Nations described above under '*First Nations considerations*', the only other comment received was from the Regional District of Central Okanagan relating to wildland urban interface fire and the recently completed Community Wildfire Protection Plan.

- employment and community dependence

In context of the Minister's letter I have noted that the harvest volumes from TFL 49 provide part of the volumes utilized in a number of Tolko mills in the surrounding area including sawmills at Armstrong, Lavington and Merritt, and at the White Valley veneer facility. Employment is also provided in logging and forest management. The current level of harvest is creating a desirable level of economic and socially beneficial activity.

From all of these considerations, I am satisfied that this AAC determination is made in consistency with the objectives of government as expressed by the Minister.

Section 8(8)(e) abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area.

- Mountain pine beetle epidemic

TFL 49, along with much of the interior of B.C., is in the later stages of a mountain pine beetle outbreak of unprecedented scale. As noted earlier in this document, the previous AAC determination of 580 000 cubic metres was set in 2005 in response to the need to address salvage harvesting of lodgepole pine-leading stands that are severely attacked or have the potential to be severely attacked. The projected spread of infested stands was accounted for in the base case using the provincial standard B.C. Mountain Pine Beetle Model. Shelf life of killed pine trees was modelled using a declining projection of percent merchantable volume over time developed in 2009 for the FLNR and the Merritt TSA licensee group using a combination of observed data and expert opinion. The assumed shelf life of a stand was the length of time since attack that the stand maintained at least 150 cubic metres per hectare of merchantable sawlog volume.

Forest Analysis and Inventory Branch staff provided me with a summary of salvage harvest performance for TFL 49 since 2001. The summary shows that there is a progression of salvage harvesting from pine dominated stands into more mixed stands. I believe this is an indication that, aside from within the Browns Creek litigation area where no harvesting has taken place since 2005, salvage is nearing completion in TFL 49.

Reasons for Decision

In reaching my AAC determination for TFL 49 I have considered all of the factors required to be considered under Section 8 of the *Forest Act* and have reasoned as follows.

In the base case the initial harvest rate of 376 500 cubic metres per year was projected to be sustainable for 10 years before falling to the mid-term harvest level of 230 500 cubic metres per year for the next 20 years. The harvest level then rose in steps of approximately 10 percent per five-year period from years 31 to 60 until it reached the non-declining long-term harvest level of 417 500 cubic metres per year. The initial harvest level of 376 500 cubic metres per year was attained by optimizing mountain pine beetle salvage for the first 10 years while maximizing the mid-term harvest level.

In determining AACs, I generally identify a number of factors which, if considered separately, indicate reasons why the timber supply may be greater or less than that projected in the base case. Some of these factors can be 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.

In my considerations for TFL 49, the following factor has been identified as a reason why the timber supply projected in the base case may have been underestimated:

- Log grade adjustments – the new interior log grade system results in logs being charged to the AAC if they meet grade specifications regardless of whether they were alive or dead at the time of harvest. This volume was not included in the base case harvest forecast. I have concluded that the harvest levels projected for the short- and mid-term in the base case have been underestimated by approximately six percent due to this factor.

I have also identified one factor in my considerations that indicates the timber supply projected in the base case was overestimated:

- Genetic gain – the values applied for genetic gain were not reduced to account planting stock availability. I have concluded that this resulted in a small overestimate of timber supply around the time of the transition from the mid- to long-term harvest levels.

In considering the above-mentioned influences, I note that the underestimation of short- and mid-term timber supply due to log grade adjustments, while significant when considered independently, is not a reason to contemplate a potential increase in timber supply when considered in the context of mountain pine beetle salvage and shelf life assumptions. Any dead potential volume harvested in the short term in place of live timber that is currently accounted for in the inventory will provide for a more robust timber supply in future. I will therefore not adjust my determination on this account.

The overestimation due to the genetic gain assumptions applied in the base case is small and affects only the transition between the mid- and long-term harvest levels in the base case forecast. I will also not adjust my determination on this account.

In considering the information available to me for this determination, I am mindful that the first period in the base case starts on January 1, 2010. I note that two years have elapsed since the start of the base case. The licensee provided me with a document that includes information about the contribution to the base case from Browns Creek and the area outside of Browns Creek. During the last eight years of the first decade of the base case forecast, the area outside of Browns Creek contributed a total of approximately 2 000 000 cubic metres. However, the AAC I determine will be in effect for up to 10 years. The total volume projected to be harvested from outside the Browns Creek area for the final two years of the term of this determination is approximately 300 000 cubic metres. Therefore, the overall total volume projected to be harvested from outside of the Browns Creek area over the next 10 years is 2 300 000 cubic metres, and this represents an annual harvest of 230 000 cubic metres.

According to the information provided by the licensee, the projected harvest volume for the Browns Creek area is approximately 126 000 cubic metres per year. The sum of these two contributions is 356 000 cubic metres per year. However, I believe that for good forest management reasons it is necessary to begin a managed transition from the initial level of the base case forecast to the mid-term timber supply. Therefore, I determine the appropriate level of harvest for TFL 49 to be 330 000 cubic metres per year.

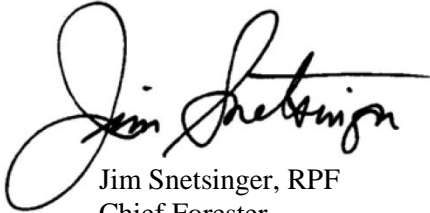
I am aware that no harvesting has taken place in the Browns Creek litigation area since approximately 2005. I am concerned that the avoidance of harvesting in this area could lead to overharvesting of the area outside of the litigation area. I therefore specify that 204 000 cubic metres of the AAC I have determined are attributable to the area outside of the Browns Creek litigation area as provided for under Section 8(5)(a.1) of the *Forest Act*.

Determination

I have considered and reviewed all 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 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved in TFL 49 by establishing an AAC of 330 000 cubic metres. Of this AAC, 204 000 cubic metres are attributable to that portion of the TFL outside of the Browns Creek litigation area.

This determination is effective on February 24, 2012 and will remain in effect until a new AAC is determined, which must take place within 10 years after the 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.


Jim Snetsinger, RPF
Chief Forester

February 24, 2012



Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (current to February 8, 2012), 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 the Crown land in the following areas:

- (i) tree farm licence areas;
- (ii) community forest agreement areas;
- (iii) first nations woodland licence areas;
- (iv) 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 that portions of the allowable annual cut are attributable to one or more of the following:

(a) different types of timber or 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;

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

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

(6) The minister must determine an allowable annual cut for each woodlot licence area, in accordance with the woodlot licence for that area.

- (7) The minister must determine an allowable annual cut for
- (a) each community forest agreement area in accordance with the community forest agreement for that area, and
 - (b) each first nations woodland licence area in accordance with the first nations woodland licence for that area.
- (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.

(9) Subsections (1) to (4) of this section do not apply in respect of the management area, as defined in section 1 (1) of the *Haida Gwaii Reconciliation Act*.

(10) Within one year after the chief forester receives notice under section 5 (4) (a) of the *Haida Gwaii Reconciliation Act*, the chief forester must determine, in accordance with this section, the allowable annual cut for

(a) the Crown land in each timber supply area, except the areas excluded under subsection (1) (a) of this section, and

(b) each tree farm licence area

in the management area, as defined in section 1 (1) of the *Haida Gwaii Reconciliation Act*.

(11) The aggregate of the allowable annual cuts determined under subsections (6), (7) and (10) that apply in the management area, as defined in section 1 (1) of the *Haida Gwaii Reconciliation Act*, must not exceed the amount set out in a notice to the chief forester under section 5 (4) (a) of that Act.

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

Section 4 of the *Ministry of Forests and Range Act* (current to February 8, 2012) 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 coordinated and integrated, in consultation and cooperation 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 sector

in British Columbia;

(e) assert the financial interest of the government in its forest and range resources in a systematic and equitable manner.

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



JUL 04 2006

Jim Snetsinger
Chief Forester
Ministry of Forests and Range
3rd 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.

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Minister of
Forests and Range
and Minister Responsible
for Housing

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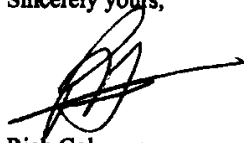
Jim Snetsinger

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