

**BRITISH COLUMBIA
MINISTRY OF FORESTS, MINES AND LANDS**

Kalum Timber Supply Area

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

Effective February 16, 2011

**Jim Snetsinger, RPF
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 as chief forester of British Columbia in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for the Kalum timber supply area (TSA). This document also identifies where new or better information is needed for incorporation in future determinations.

Acknowledgement

I am indebted to staff of the BC Ministry of Natural Resources Operations (MNRO) in the Kalum Resource District, and the Ministry of Forests, Mines and Lands (MFML) Forest Analysis and Inventory Branch (FAIB), for compilation and preparation of the information I have considered in this determination. I am also grateful to the individuals, First Nations and companies who contributed to the timber supply review (TSR) process.

Description of the Kalum Timber Supply Area

The Kalum Timber Supply Area (TSA) in north-western British Columbia covers about 2.3 million hectares, ranging from the Kitlope River in the south to the lower Nass River in the north. The TSA boundary encompasses TFLs 1 and 41, part of the Nisga'a private land under the Nisga'a Final Agreement, and several large protected areas along the outer boundary of the TSA. These protected areas include Gitnadoix River Park, Foch Gilttoyees Park, and the Kitlope Heritage Conservancy. These areas do not contribute to the TSA's timber supply. The core area of the TSA excluding these areas is approximately 522 700 hectares.

The Kalum TSA borders the Nass, Kispiox, Bulkley, Morice and North Coast TSAs. The TSA is administered from the Kalum Resource District office in Terrace which lies roughly at its geographic centre. Because of the rugged, mountainous landscape, a relatively small portion of the core TSA consists of productive forest land suitable for harvesting timber.

The Kalum TSA lies in a transitional area between the coastal and interior forests. The landscape is dominated by the Coastal Western Hemlock biogeoclimatic zone and forests by association are dominated largely by western hemlock. Other major tree species include mountain hemlock, balsam, cottonwood, spruce, cedar, pine, aspen and birch. The terrain varies from flat valley bottoms, to rugged mountainous upper slopes.

The diverse forested environment provides habitat for a wide variety of wildlife species including grizzly bear, black bear, Kermode bear, deer, fisher, northern goshawk, moose, marten, raptors and owls.

The 2006 Kalum Sustainable Resource Management Plan (SRMP) guides land use and resource management within the Kalum TSA. The current (2000) AAC for the Kalum TSA under Section 8 of the *Forest Act* is 436 884 cubic metres.

History of the AAC

Table 1. History of the AAC

Effective date	Decision
1981	AAC for Kalum South portion of Kalum TSA – 450 000 m ³ /year
1986	AAC for Kalum South portion of Kalum TSA – 480 000 m ³ /year
1995	Kalum TSA split into Kalum TSA(formerly Kalum South) and Nass TSA (formerly Kalum North)
Jan 1, 1996	New AAC for Kalum TSA – 464 000 m ³ /year
Jan 1, 2000	New AAC for Kalum TSA – 459 684 m ³ /year
May 12, 2000	AAC reduced by 22 800 to 436 884 m ³ /year as a result of Nisga'a Final Agreement
July 15, 2003	AAC determination legally postponed

The harvestable volume for the area is currently apportioned as follows:

Table 2. Apportionment of the current AAC (cubic metres per year)

Forest Licences – Replaceable	283 201
Forest Licences – Non-Replaceable	29 107
BCTS Timber Sale Licence	88 228
Woodlot Licence	2 074
Community Forest Agreement	30 000
Forest Service Reserve	4 274
Total	436 884

New AAC determination

Effective February 16, 2011, the new AAC for the Kalum TSA will be 424 000 cubic metres. This AAC will remain in effect until a new AAC is determined, which may take place within 10 years of this determination.

Information sources used in the AAC determination

Sources of data and information referenced for this AAC determination include references listed in the analysis report and the following:

- Kalum Land and Resource Management Plan (LRMP). Integrated Land Management Bureau, 2002;
- Kalum Sustainable Resource Management Plan (SRMP). Integrated Land Management Bureau, 2006;
- Procedures for factoring visual resources into timber supply analyses. Ministry of Forests, 1998;
- Age to green-up height: using regeneration survey data by region, species and site index. Ministry of Forests, 2000;
- Bulletin – Modelling visuals in TSR III. Ministry of Forests, 2003;
- Kalum TSA timber supply review data package (updated). Ministry of Forests and Range, 2010;
- Kalum TSA timber supply analysis public discussion paper. Ministry of Forests and Range, 2010;
- Kalum TSA timber supply analysis technical report. Ministry of Forest and Range, 2010;
- Documentation of analysis for vegetations resource inventory statistical adjustment – Kalum TSA. (unpub) Churlish, G. and Jahraus. Ministry of Forests and Range, 2010;
- Landscape and stand scale structure and dynamics, and conservation raking of Skeena River floodplain forests. de Groot, A.S., Haeussler, S., and Yole, D. Bulkley Valley Centre for Natural Resources Research and Management, Smithers, B.C., 2005;
- *Forest and Range Practices Act*, consolidated to January 19, 2011;
- Forest Planning and Practices Regulations, as amended up to July 25, 2008;
- Kalum TSA and Nass TSA operability study. (unpub) Magellan Digital Mapping, 2006;
- Multiple-pass harvesting and spatial constraints: an old technique applied to a new problem. For. Sci. 39(1):137-151. Nelson, J.D. and Errico, D., 1993;
- Site index adjustments for old-growth stands based on veteran trees. Ministry of Forests Working Paper 36/1998. Nigh, G.D., 1998;
- Site index adjustment for old-growth coastal western hemlock stands in the Kalum Forest District. Ministry of Forests Working Paper 27/1997. Nigh, G.D. and Love, B.A., 1997;
- Site index adjustments for old-growth stands based on paired plots. Ministry of Forests Working Pap. 37/1998 Nussbaum, A.F., 1998;
- Implementation of the VRI adjustment strategy – Kalum TSA. Ministry of Forests and Range. Victoria, B.C. Unpubl. Rep. Penner, M., 2009;
- Procedures for Carrying out Visually Effective Green-up (VEG) Tree Height Assessment in Scenic Areas. Northern Interior Forest Region, Ministry of Forests and Range. unpubl. rep. Roberge, L. 2007;
- Delivered log cost analysis for the Kalum Forest District. Northwest Timberlands Ltd., Terrace B.C. Ziegler, R. 2009;

- Summary of dead potential volume estimates for management units within the Northern and Southern Interior Forest Regions. Ministry of Forests and Range. March 2006;
- Memo from the Regional Executive Director, Northern Interior Forest Region to the Chief Forester, Re: Consideration of the disposition of the undercut that has accumulated in the Kalum Timber Supply Area in the Timber Supply Review. March 9, 2010;
- Letter from the Minister to the Chief Forester, Re: Economic and Social Objectives of the Crown, July 4, 2006;
- Memorandum of Understanding between Northwest BC Forest Coalition and Global Bio-Coal Energy Inc. May 17, 2010;
- Memorandum of Understanding between Northwest BC Forest Coalition and Proponent for Purchase of West Fraser Timber Co. Ltd.'s Eurocan Paper Mill. May 2010;

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 the Kalum TSA 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 (THLB) 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 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 proposed 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 TSA 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 the Kalum TSA. It is also independent of any decisions by the Minister of Forests, Mines and Lands 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, Mines and Lands (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 TSR program for TSAs and Tree Farm Licences (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 TSA 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 any adjustments to its predictions of timber supply must be made, if necessary, to more properly reflect the current situation.

Such adjustments are made on the basis of informed judgement using current, available information about forest management that may well have changed since the original information package was assembled. Forest management data are particularly subject to revision during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans. Thus it is important to remember that while the timber supply analysis with which I am provided is integral to the considerations leading to the AAC determination, the AAC is not determined by calculation but by a synthesis of judgement and analysis in which numerous risks and uncertainties must be weighed. Depending upon the outcome of these considerations, the resulting AAC may or may not coincide with the base case forecast. Moreover, because some of the risks and uncertainties considered are qualitative in nature, once an AAC has been determined, further computer analysis of the combined considerations may not confirm or add precision to the AAC.

Base case for the Kalum TSA

The timber supply analysis was completed by staff from the Forest Analysis and Inventory Branch (FAIB) of the Ministry of Forests, Mines and Lands (MFML) using the Woodstock timber supply modelling system in optimization mode. Woodstock has been used recently in the Lakes and Quesnel TSAs and for several tree farm licences. The analysis was completed in March of 2010, with additional sensitivity analysis using new information being completed in June 2010.

The overall objective in the analysis was to maximize the total volume harvested, while meeting all forest cover constraints for non-timber forest values (e.g. wildlife habitat, scenic areas and riparian areas) over the 250-year planning horizon. This reflects the maximum productivity of the TSA under current forest management practices. The harvest flow objectives were to: 1) maintain the current AAC of 436 884 cubic metres as long as possible; 2) constrain harvest level reductions to 10-percent-or-less per decade; and 3) achieve an even-flow long-term harvest level that provides for a stable growing stock as soon as possible.

In the base case, an initial harvest level of 436 884 cubic metres – the level of the current AAC – could be maintained for two decades before decreasing by about nine percent per decade to the mid-term harvest level of 353 876 cubic metres per year. In decade 10, the harvest level increases to the long-term level of 421 226 cubic metres per year.

The transition from harvesting high volume natural stands to harvesting lower volume second-growth stands begins in decade four. During the transition period, the projected harvest decreases to the lower mid-term levels because there are insufficient merchantable second-growth stands to support harvesting at the long-term level until around decade 10. Once there is sufficient volume in managed stands, harvest levels begin to increase and by decade 14, most of the harvest is attributable to second-growth stands.

The average volume per hectare harvested during the first two decades in the analysis is about 540 cubic metres. As the higher volume existing stands are harvested, the volume per hectare decreases. In the long term, the average volume per hectare is higher than during the first two decades because second-growth stands have higher yields than existing stands.

In the Kalum TSA, mature pine stands account for only two percent of the THLB. To reflect the impact of mountain pine beetle, all mature pine stands were assumed to be infested, ‘harvested’ by beetles and the stand volumes excluded from the projected harvest level during the first decade. The impact of *Dothistroma sp.* needle blight was addressed in the analysis by reassigning new species or stand ages to affected stands. The base case harvest forecast accounts for unsalvaged losses of 5000 cubic metres per year.

I have reviewed the assumptions and methodology incorporated in the base case projection and related sensitivity analyses. As part of this review, I have examined projections over the forecast period for the growing stock of timber in the TSA, including the dominant tree species, their age and the average age at which they are harvested, as well as their contributions to the volumes of timber projected to be harvested over time. Details of my considerations of particular aspects of the analysis and its projections, in some cases in relation to uncertainties in associated assumptions, are provided in following sections of this document.

From my review of the timber supply analysis, including discussions with the MFML analyst who conducted the analysis, I find that the base case forecast provides a reliably informative basis of reference for my considerations in this determination. In addition to the base case, I have reviewed sensitivity and alternative analyses which have also been helpful in my considerations as documented in the following sections and in the reasoning leading to my determination.

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*. For factors, where 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.

For factors where I 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 3.

Table 3. List of factors for which base case modelling assumptions have been accepted

<i>Forest Act section and description</i>	<i>Factors accepted as modelled</i>
8(8)(a)(i) Composition of the forest and its expected rate of growth	<ul style="list-style-type: none"> • land outside the core TSA – TFLs, parks, Nisga'a land • non-forest, non-productive forest, non-commercial cover • land within the core TSA not administered by BC Forest Service for TSA timber supply • environmentally sensitive areas / unstable terrain • low timber growing potential • problem forest types • existing forest Inventory • site productivity estimates • minimum harvestable ages • volume estimates of regenerating stands
8(8)(a)(ii) Expected time for the forest to be re-established following denudation	<ul style="list-style-type: none"> • regeneration delay • not satisfactorily restocked / backlog
8(8)(a)(iii) Silvicultural treatments to be applied to the area	<ul style="list-style-type: none"> • silviculture systems • incremental silviculture
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	<ul style="list-style-type: none"> • utilization standards and compliance
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for other purposes	<ul style="list-style-type: none"> • land use plans • ungulate winter range • tailed frog • patch size distribution • Kalum SRMP special management zones • rare and endangered plant communities • research installations and growth and yield plots • landscape-level biodiversity – old growth • landscape-level biodiversity – other seral stage distributions • riparian management • stand-level biodiversity • recreation • scenic resources • First Nations cultural heritage resources

Forest Act section and description	Factors accepted as modelled
8(8)(a)(vi) Other information	<ul style="list-style-type: none"> • First Nations land interests
8(8)(b) Short and long-term implications of alternative rates of timber harvesting from the area	<ul style="list-style-type: none"> • harvest sequencing
8(8)(d) Economic and social objectives of the government	<ul style="list-style-type: none"> • local objectives
8(8)(e) Abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	<ul style="list-style-type: none"> • unsalvaged losses – general • <i>Dothistroma</i> needle blight • mountain pine beetle

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 harvest

- *general comments*

A series of deductions were made from the Crown productive forest land base to derive the timber harvesting land base (THLB), which is the area considered to be available for timber harvesting. In reviewing these deductions, I am aware that some areas may have more than one classification. To ensure accuracy in defining the THLB, care must be taken to avoid any potential double counting associated with overlapping objectives. Hence, a specific deduction for a given factor reported in the analysis or the AAC rationale does not necessarily reflect the total area with that classification; some portion of it may have been deducted earlier under another classification.

For the Kalum TSA, I acknowledge that the above approach was used in the timber supply analysis, resulting in a long-term THLB of 80 820 hectares, which means that 77 498 hectares (49 percent) of productive forest are unavailable for timber harvesting for a variety of reasons. The current THLB is 14 percent smaller than the land base assumed in the 1999 analysis. Several factors contributed to this decrease, principal among them being assignment of land under the Nisga'a Final Agreement, establishment of new protected areas, wildlife habitat area and ungulate winter ranges, and a community forest agreement.

As indicated in Table 3, I accept most of the land base factors as applied in the base case. Two of the land base factors warrant discussion below, but I conclude that all of the land base factors are consistent with current practice, and the information as used in the analysis represents the best information available.

- *physical and economic operability*

New operability mapping was created by the 2006 Harvest Method Mapping (HMM) project, which classified areas in the TSA by harvest method (ground, cable, aerial) and stand quality class (sawlog, marginal sawlog or pulplog). In the base case, areas that were classified as inoperable or as aerial-pulplog were excluded from the THLB. Local licensees supported this approach.

However, district staff indicate that this approach does not adequately represent the THLB under current economic conditions. They maintain that the closure of all major mills in the region has significantly affected the structure of the forest sector in the northwest. The loss of local processing facilities has contributed to reduced log prices in the area and licensees now operate as market loggers who respond directly to log prices.

The viability of harvest operations in the Kalum TSA is highly sensitive to log prices, which have been low since 2002, and the ability to sell the low quality logs generated by harvesting. Operations are particularly sensitive to sawlog prices because the harvest of sawlogs often helps to offset the cost of pulplog harvesting. Licensees are dealing with low log prices by minimizing road development, focusing on ground-based logging, and focusing on areas close to Terrace.

A 2009 study of delivered log costs in the Kalum Resource District examined costs for road development, logging, hauling, silviculture and administration for the mature stands in THLB. A separate analysis combined information from this study with log prices to assess economic viability of the mature THLB at a strategic level. The results indicate that based on the maximum sawlog and pulplog prices from the past five years, only 18 percent of the mature THLB is economically viable for harvesting under current conditions.

Given current market conditions, I consider it unlikely that much of the timber from this TSA will be economically operable in the short term. However, the TSA boasts a large fibre supply, a highly skilled workforce and the region remains well positioned to respond to an upswing in global markets. Furthermore, I am mindful of the efforts being made by the Northwest BC Forest Coalition to attract new investment in processing facilities to the Terrace area. The coalition is comprised of forest tenure holders and BC Timber Sales and its goal is to both inform and encourage investment in the northwest region of BC. If these efforts are successful, then the economic viability of mature stands in the THLB could improve.

In order to ensure that harvesting is not unduly concentrated on a particular timber type, terrain or geographic area, I can establish a partition. In this case, a partitioned AAC could help to address the currently reduced 'economic' THLB, while maintaining future harvest opportunities in areas that are currently uneconomic to harvest. However, there is insufficient information about harvesting trends to define a partition based on timber type, terrain or geographic area that would successfully address the current situation. In order to address this issue in subsequent timber supply reviews, I request district staff monitor harvest patterns within the TSA and that this information is incorporated in subsequent timber supply reviews, as noted under '**Implementation**'.

Public input regarding the economic viability of the TSA, including letters from Kitsumkalum (dated May 14, 2010) and Skeena-Nass Centre for Innovation in Resource

Economics (dated May 14, 2010), supports maintaining the current AAC as a way of maintaining future economic development opportunities.

Based on my review of the operability information used in the analysis, I accept that this factor was appropriately addressed in the base case. I consider the current viability of harvest operations to be a reflection of short-term economic conditions and that – economic considerations aside – the timber supply for the Kalum TSA remains robust. For the next determination, I encourage licensee and district staff to monitor the response of harvest operations to changing market conditions and to revisit the economic operability of the THLB, as noted under ‘**Implementation**’.

- *roads, trails and landings*

The area associated with roads, trails, and landings (RTL), including roadside debris piles, is excluded from the THLB in the base case.

Site degradation surveys from 1992 associated with timber supply reviews for Tree Farm Licences (TFLs) 1 and 41, and the Kalum TSA, indicated that a weighted average of 8.8 percent of cutblock area is occupied by RTLs. On this basis, a reduction factor of 8.8 percent of cutblock area was used for previously logged areas that are 45 years or younger in age, including stands harvested by helicopter. The same 8.8 percent reduction was applied to unlogged areas older than 45 years to account for future RTLs. This resulted in the exclusion of 2697 hectares and 4006 hectares from the THLB to account for existing and future RTLs, respectively. No reduction was applied to account for loss of productive area in logged stands older than 45 years.

During the previous timber supply review for the Kalum TSA and in response to the data package for this timber supply review, West Fraser Mills indicated that application of an 8.8 percent netdown was too high. Recent information from the Ministry of Forests, Mines and Lands Reporting Silviculture Updates and Land Status Tracking System (RESULTS) for the Kalum TSA, for harvest since 1997, indicates that an average of 6.3 percent of the gross cutblock area is occupied by RTLs; however, district staff note that this estimate does not account for roadside debris piles. They inform me that they have observed significant area loss due to roadside debris piles that are not burned or otherwise removed.

While I acknowledge that there is uncertainty regarding the amount of productive forest area lost to roadside debris piles, in the absence of information to quantify the potential impact, I accept that the 8.8 percent reduction applied in the analysis is adequate for use in this determination.

Discrepancies due to the application of RTL reductions in logged stands older than 45 years, which should have received RTL reductions, and helicopter logged stands, which should not have received RTL reductions, effectively offset each other; therefore, I conclude that overall, the total estimate for both existing and future RTLs is reasonable.

In order to reduce the uncertainty regarding the area reduction for RTLs used in subsequent timber supply analyses, I request that district staff monitor debris piles across the TSA over time in order to evaluate the roadside debris assumptions used in the analysis, as noted in ‘**Implementation**’.

Expected rate of growth

- *volume estimates for existing stands*

The inventory used for the Kalum timber supply analysis consists of two components:

- Forest Inventory Planning (FIP) data from 1992 converted to Vegetation Resource Inventory (VRI) format for most of the TSA; and
- original VRI data from 1999 for the Kitimat Valley.

The inventory was updated for disturbances to 2005 and volumes were projected to January 2008.

VRI Phase 2 ground sampling and Net Volume Adjustment Factor (NVAF) sampling were completed in 2004. NVAF sampling results were used to calculate adjustment ratios for eliminating bias in volume estimation due to taper and cruiser error in the volume estimates for the Phase 2 volume samples. The modified Phase 2 ground sampling results were used to calculate adjustment ratios for VRI attributes of age, height, basal area, trees per hectare, and volume net of decay and waste. The Phase 2 adjustment ratios were applied to the inventory attributes and new site index values were calculated from the adjusted ages and heights. The adjusted attributes were used to generate the stand volumes and yield tables used in the base case.

Additional VRI Phase 2 ground and NVAF sampling was completed in 2009. The samples were pooled with the samples from 2004 to calculate new adjustment ratios in March 2010. However, this occurred after the timber supply analysis was completed, so the 2010 inventory adjustments were not accounted for in the base case.

The results of a sensitivity analysis to examine the effect of not using the 2010 adjustment ratios in the base indicate that the timber supply has been overestimated by 26 000 cubic metres per year or about six percent for the first decade of the harvest projection.

The volume estimates used in the analysis represent the best available information at the time the analysis was conducted. However, the results of the sensitivity analysis indicate that use of the 2010 adjustment ratios results in a 26 000-cubic metres per year or six percent overestimation of the base case short-term harvest level and I have accounted for this in my determination as discussed in '**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 3, I accept as modelled the factors usually considered under this section, and I will not discuss them further.

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

As noted in Table 3, I accept as modelled the factors usually considered under this section, and I will not discuss them further.

- (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:**

Decay, waste and breakage (DWB), and endemic dead volume (log grade changes)

I have reviewed with district staff the assumptions applied in the 2010 analysis respecting volume adjustments for decay, waste and breakage, and implications resulting from the April 1, 2006 changes in log grades. I am satisfied that decay, waste and breakage (DWB) as reflected by the current inventory, and the VDYP and TIPSY models is the best available information and was incorporated into the base case appropriately.

I am aware the April 1, 2006 log grade changes result in dead trees harvested not previously charged to the AAC now being charged. I am also aware that on average, about 3.2 percent of the volume harvested in the Kalum TSA originated from dead trees.

Most healthy forests have a small proportion of standing dead trees that cannot be made into logs due to the degraded wood quality and deep cracks. I note that the merchantable volumes in the forest inventory and in the projections of stand growth do not account for this volume.

As such, I conclude that the base case short-term timber supply is underestimated by 3.2 percent due to the underestimation of merchantable volumes resulting from the lack of accounting for dead trees, and I account for this in ‘**Reasons for Decision**’.

- (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

- *grizzly bear*

The Kalum SRMP specifies mid-seral requirements for grizzly bear habitat in the McKay-Davies and Copper watersheds and these were modelled in the base case.

In public input, the Lakelse Watershed Society in a letter dated June 30, 2009 expressed concern about “the management directives for grizzly wildlife habitat areas for Lakelse, as they were not identified in the SRMP.”

District staff indicate that the Ministry of Environment is currently in the process of establishing grizzly bear wildlife habitat areas (WHA). However, at present this work has not been completed and no orders have been issued to designate grizzly bear WHAs.

In accordance with my guiding principles, it is not my practice to speculate on the timber supply impacts associated with land use requirements that have not been finalized and established as legal requirements by government. Therefore, I accept that the assumptions used in the base case for grizzly bear reflect current management requirements and are therefore, appropriate for use in this determination. If grizzly bear WHAs are established by government, this information can be accounted for in subsequent timber supply reviews.

- *community watersheds*

Eleven community watersheds have been designated within the Kalum TSA. Five of these watersheds are new community watersheds established by the Kalum SRMP in 2006. In order to account for community watersheds in the analysis, 1826 hectares were excluded from the THLB.

The timber supply analysis includes constraints for community watersheds in keeping with the Kalum SRMP clearcut equivalency requirement, which is intended to maintain water quality with the watersheds. The equivalency requirement specifies that no more than 20 percent of the total area of each watershed larger than 250 hectares can be below green-up requirements at any one time. Of the community watersheds in the Kalum TSA, only the Deep Creek, Wathl Creek and Drake Cree watersheds are larger than 250 hectares.

The Lakelse Watershed Society in a letter dated June 30, 2009 expressed concern that logging has been approved in the Hatchery Creek Watershed (Granite Creek), stating that it was one of the last remaining undeveloped creeks and that a study conducted by Forrex in 2008 supported the idea that this area become an 'ecological monitoring unit'.

I appreciate the concern expressed by the Lakelse Watershed Society; however, in making AAC determinations it is not my practice to speculate on the potential timber supply impacts of future management requirements. If the legally-established management requirements for the Hatchery Creek Watershed change prior to the next determination, this information can be reflected in the base case at that time. For this determination, I accept that the forest management assumptions for community watersheds were modelled appropriately and I will make no adjustment to the base case on this account.

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

Other information

- *harvest performance/undercut*

Between 2005 and 2009, only about 34 percent of the AAC for the Kalum TSA was harvested. Since 2002, about 1.24 million cubic metres that could have been harvested under the current AAC have not been harvested. This unharvested volume is referred to as 'undercut'.

District staff indicate that this low level of performance is due in part to: the low quality of the existing mature volume on the TSA, high operating costs, the closure of local processing facilities and current economic conditions.

Under Section 12 of the *Forest Act*, it is the Regional Executive Director who has the authority to dispose of undercut volume, not the Chief Forester. However, in the context of timber supply, it is important to ensure that the volume attributable to stands that would have been harvested if the full AAC had been utilized do not do 'double duty' by contributing to both the harvest levels projected in the base case and undercut disposition.

In order to assess the risk to the timber supply, sensitivity analyses were prepared that examined the effects of disposing of the undercut under a variety of disposition

alternatives. The results show that harvesting of the current undercut for the Kalum TSA has little effect on the base case harvest levels across the entire harvest projection. From this I conclude that there is little risk to timber supply associated with the disposal of undercut volume in the Kalum TSA at this time.

- *second-growth harvesting*

Philpot Forestry Services Ltd., in a letter dated July 9, 2010 expressed concern about the practice of harvesting second-growth stands at an early age in the Kalum Resource District. This input was not provided specifically in response to the current timber supply review for the Kalum TSA; however, I am mindful that this is an issue that has the potential to affect future harvest levels.

In order to assess the risk associated with the early harvesting of second-growth stands, a sensitivity analysis was prepared to examine the timber supply effects of this practice. For this scenario, top harvest priority was assigned to all available second-growth stands above minimum harvestable age in the model. The results indicate that while this practice has no effect on either the short- or mid-term harvest levels, the long-term harvest level projected in the base case was decreased by 3.6 percent.

The early harvesting of second-growth stands in the Kalum TSA is a recent practice and there is still very little information to indicate the extent to which this approach will be adopted. Therefore, I will not account for early second-growth harvesting in this determination. However, in recognition of the risk to the long-term timber supply, I encourage local forest professionals to work collaboratively to develop and apply local guiding principles for second-growth harvesting in the district and I request that the Kalum Resource District Manager facilitate this process.

- *First Nations consultation, land interests, and cultural heritage resources*

The Crown has a duty to consult with and accommodate, if necessary, those First Nations for whom it has knowledge of the potential existence of aboriginal interests that may be impacted by a proposed decision, including strategic-level decisions such as AAC determinations. As chief forester, I must therefore consider information arising from the consultation process with First Nations respecting aboriginal interests and treaty rights that may be affected by my AAC determination. As well, I will consider other relevant information available regarding aboriginal interests, including information gathered during other consultation processes.

Seven First Nations have asserted traditional territories overlapping the Kalum TSA and include Gitga'at, Gitksan, Haisla, Kitselas, Kitsumkalum, Lax Kw'alaams and Metlakatla. Of these First Nations Haisla, Kitselas, and Kitsumkalum have communities within, or very close to, the core area of the Kalum TSA.

As part of the treaty settlement for Nisga'a Nation areas of Crown land were transferred to the Nisga'a under the Nisga'a Final Agreement. This area is excluded from the THLB. In addition, the Nisga'a Final Agreement gives the Nisga'a rights to two areas known as the Nass Wildlife Area and the Nass Area, which are not located within the core area of the TSA. Since the Nisga'a Lands are located within the TSA, the Nisga'a Nation was included in the Kalum TSA timber supply review consultation process.

In addition to these eight First Nations, there are three First Nations who have small areas of overlap with the TSA and they are Hagwilgate, Office of the Wetsuwet'en, and Skin Tyee. Based on a review of available information for these First Nations, these small areas of overlap are mainly within alpine and isolated areas outside the THLB. Due to the location and size of these overlap areas, the Kalum TSA AAC decision would have little to no impact to these First Nations' aboriginal interests and traditional territories, and therefore they were not included in the Kalum TSA timber supply review consultation process.

The Kitselas and Kitsumkalum First Nations are currently involved in treaty negotiations with the Province. At this time, Areas in Principle are being negotiated and may include a significant portion of the Kalum TSA. Ratification and implementation of the treaty is expected to take several years, as such, any land impacts from these treaty negotiations will be reflected in the next timber supply review process, if applicable.

In December 2009, the Province and First Nations from the Central and North Coast including Metlakatla, Haisla and Gitga'at, signed the Coastal Reconciliation Protocol that provides a framework for reconciliation. The Coastal Reconciliation Protocol features shared decision-making related to resource and land use, revenue sharing including the sharing of carbon offsets, and provincial-federal funding for the new Klemtu ferry terminal. These provisions will not be impacted by an AAC decision for the Kalum TSA.

The First Nations consultation process for the Kalum TSA timber supply review was based on current government direction, and as part of this direction, preliminary assessments of First Nations' aboriginal interests and an analysis of the potential impact this AAC decision may have on those interests were conducted. Sources of information reviewed for these assessments include available traditional use studies, known aboriginal interests from previous consultation processes, ongoing and previous litigation and affidavit information, ethno-historic reports, distance from the development area to First Nations' reserves, and status of treaty land claims. Based on the information available and the potential impact an AAC decision might have on First Nations' aboriginal interests, the suggested level of consultation for the seven First Nations was normal providing 60-days to respond, while the level of consultation for the Nisga'a Nation was notification.

Consultation on the Kalum TSA timber supply review began in October 2006 and concluded in May 2010. Consultation was initiated with a letter notifying First Nations that the timber supply review was starting and requested their input on how the AAC decision might impact their aboriginal interests, and encouraged them to participate. These initial letters were also sent to Gitxsan Treaty Society and the Gitxsan Luulak Wilp.

Overview sessions of the timber supply review process were held with Gitxsan on February 28, 2008, Haisla on April 4, 2007, and with Kitsumkalum on February 15, 2008. Prior to the data package being released, the following meetings were held with Gitxsan on March 17, 2008, Haisla on September 24, 2008, Kitselas on November 18, 2008, Kitsumkalum on October 2, 2008, and Nisga'a on October 4, 2008.

During the meetings with Haisla, the use of cedar oil was discussed and Haisla acknowledged this would have no impact on the growth and yield of cedar. They also raised concerns with the spatial location of timber supply and sustainability within watersheds. MNRO district staff explained the nature of the data and how it is used in the timber supply model, and following this discussion Haisla recommended the model be used to report on harvest levels by landscape unit.

The Kitselas raised concerns of the sustainability of redcedar and an increase in the BCTS apportionment. MNRO district staff responded by letter on April 28, 2009 indicating the district is committed to assisting in the development of a redcedar management strategy, and currently I am aware of ongoing discussion with Kitselas is underway. It was also explained that apportionment is under the responsibility of the minister and is separate from the chief forester's AAC decision.

The Northwest Transmission Line was raised at a meeting with Kitsumkalum, and it was explained the right-of-way and additional clearing is estimated to impact 0.2 percent of the THLB. Since construction for the transmission line will not take place for several years, it has a negligible impact on the Kalum TSA AAC for this timber supply review process. Any land base removals will be reflected in future timber supply reviews.

The Nisga'a also raised concerns about sustainability of redcedar and the Northwest Transmission Line. MNRO district staff indicated the data package identifies the sustainability of cedar harvesting and regeneration as a significant concern and it is difficult to track the volume and growth of a single species in the timber supply model, however the forest cover inventory would be explored to determine if cedar harvesting can be tracked. A similar response regarding the Northwest Transmission Line given to Kitsumkalum was also provided to Nisga'a.

In addition to the meetings with Gitxsan, they provided a letter in March 2008 raising the following concerns:

- Request to update cultural resource inventory.
- "No work zones" be specified by the impacted Wilps for spiritual and cultural purposes.
- Application of sustainability principles to the Gitxsan Lower Skeena Watershed as a whole, opposed to the watershed being split between the Kalum and Kispiox TSAs and their associated timber supply review processes.
- Incorporate Gitxsan water and forests policies into the timber supply review process for the Gitxsan Wilps areas.
- Include domestic and cultural uses in the data package.

In April 2008, MNRO district staff responded to Gitxsan's concerns in a letter. District staff indicated, there is currently no cultural resource inventory, however riparian areas and wildlife tree patches protect many cultural features. Since these features are quite small relative to the TSA, they would be best managed at the operational level. District staff indicated they are not aware of "no work zones", but requested that they be identified with objectives so they could be appropriately addressed in the timber supply

review. No further information on the “no work areas” was provided. In regards to the application of sustainability principles to the Gitxsan Lower Skeena Watershed, it was explained that AACs are determined for each management unit and the timber supply analysis accounts for sustainability through the application of wildlife tree patches, patch size distribution, wildlife habitat, and seral stage targets. Harvest levels for the Lower Skeena Watershed may be reported if requested. In addition, Gitxsan requested that Gitxsan policies on water and forests to be applied in Gitxsan Wilps areas. The timber supply analysis already incorporates policies on biodiversity at the stand and landscape levels, wildlife habitats, riparian management zones, community watersheds and visual quality objectives. District staff did request further information on their forest and water policies, however no information was provided. Finally, Gitxsan requested that domestic and cultural uses be included in the data package. District staff indicated timber supply review considers the overall harvest rate for the TSA and free use permits are available from the district office for domestic and cultural uses of timber.

Consultation was undertaken on the data package with all affected First Nations. Letters were sent in April 2009, to those First Nations who met with MNRO staff or provided comments in a letter regarding the development of the draft data package. It was explained how the information they provided was addressed in the data package. At the same time, letters were also sent to the remaining First Nations who did not provide comments prior to the release of the data package. They were asked to review the data package and provide any input. These letters were also sent to the Gitxsan Luulak wilp, Gitxsan Sakum Higookxw wilp, and Gitxsan Tenim Gyet wilp.

In June 2009, Lax Kw'alaams sent a letter notifying MNRO district staff of their Interim Land and Marine Resources Plan of the Allied Tsimshian Tribes of Lax Kw'alaams, in which this plan designates the Skeena River corridor as a special management area. “Special management areas are to be managed to ensure that traditional use, cultural heritage and natural resource values are protected and sustained, while enabling integrated resource development that benefits Lax Kw'alaams members.” In February 2010, district staff responded explaining the timber supply analysis accounts for special resource management zones, landscape connectivity corridors, OGMAs, rare ecosystems, riparian management areas and wildlife tree patches, and many of these are located in the Skeena River corridor.

Following in November 2009, Haisla requested an application of an equivalent clearcut area (ECA) in Kitimat Valley be analysed to explore how ECA could address water quality issues. Since Kitimat Valley is largely outside the Kalum TSA, it was agreed this analysis was not necessary.

Prior to the release of the Kalum TSA Timber Supply Analysis Public Discussion Paper (PDP), a meeting was held with Kitsumkalum in February 2010. A discussion was had regarding the Kitsumkalum land use plan, mushroom picking areas, and cultural heritage resources. They provided district staff a copy of their land use plan and a map of cultural heritage features they would like protected. Following the meeting, district staff responded in an email confirming most of the priority mushroom picking areas are outside the Kalum TSA. While there are a number of cultural heritage features, they may

not constitute a significant enough area overall to be included as a netdown in a higher level process such as timber supply review, because they are small in size relative to the TSA. It was also mentioned that many of these features are already included in riparian areas where there is no timber harvesting.

Letters were sent in March 2010 to all First Nations requesting their review and input on the Timber Supply Analysis PDP. For each First Nation the response period for consultation exceeded the standard 60-day consultation period.

Later in March 2010, Kitselas provided input in a letter expressing concerns on the apportionment process and the exclusivity given to BCTS within proposed pricing areas in Kitselas' traditional territory that overlap with the Kalum TSA, TFL 1 and TFL 41. Kitselas also indicated they support the recommended harvest levels in the short-, mid- and long-term. A response was provided by district staff indicating their concerns will be considered under the appropriate administrative decisions.

In April 2010, a meeting was held with a Gitksan individual who expressed concerns of TFL 1 being used to assert Tsimshian claim to Gitksan territory. Additionally, Gitksan interests and uses in Legate and Oliver Creeks were discussed. Following in May 2010, district staff responded in a letter indicating issues regarding TFL 1 do not apply to the Kalum TSA and harvesting tenures cannot be used to assert territory claims. A description of the strategic nature of timber supply reviews, the process of land base reductions, and the operational approach used to managing identified values was provided. Following in May 2010, a meeting was held with Gitksan Chiefs, Gitksan members, and district staff. A general discussion regarding timber supply review and other related issues occurred.

Kalum Ventures Ltd. is an independent arm of the Kitsumkalum and is a licensee in the TSA. Kalum Ventures sent a letter in May 2010 suggesting the AAC remain at the base case for the next 10 to 20 years so as not to limit any future economic opportunities that are currently being pursued by Kalum Ventures and other local tenure holders.

In July 2010, I met with Gitksan representatives at which time they raised the following concerns:

- Lack of communication with licensees operating in Gitksan territory.
- Desire for tenures in Gitksan territory in the Kalum Resource District.
- Desire for volume resulting from the right of way for the Northwest Transmission Line to be used for domestic and cultural uses.
- Access to timber for domestic and cultural needs.
- General discussion of Gitksan Forest Enterprise's challenges as a licensee.

In response, district staff will assist in facilitating the coordination of meetings with licensees and Gitksan. District staff encouraged Gitksan to pursue discussions on acquiring tenures in the Kalum Resource District during formal negotiations on new tenure agreements. It was further explained the only volume available in the TSA is undercut volume, which is under the authority of the regional executive director who will consider the disposition of undercut if an appropriate business case is presented. In

regards to Gitxsan's desire for the volume that will be made available as a result of the Northwest Transmission Line was forwarded to MNRO staff involved in consultation on the Transmission Line. Finally, Gitxsan were informed that First Nations Free Use Permits are available to provide access to timber for domestic and cultural uses and can be requested from the district office.

I am also aware through First Nations input that some confusion exists surrounding the link between harvest tenure and territory claims. I would like to assure First Nations that harvesting tenures cannot be used to assert territory claims.

I am aware of the number of concerns raised by Gitg'at, Gitxsan, Kitselas, and Nisga'a First Nations regarding the sustainability of the western redcedar harvest. Since western redcedar occurs most often as a minor component in stands of other leading species within the TSA, its volume could only be tracked for existing natural stands. There was insufficient information to track cedar volumes for regenerated stands. In light of the concerns surrounding western redcedar sustainability, I have instructed district staff to aid in the development of a western redcedar management strategy for the Kalum Resource District and I have discussed this further under '**Implementation**'.

I am also aware that several First Nations have expressed an interest in having additional volume apportioned to them. As mentioned previously in this rationale, the apportionment of volume falls outside my authority under Section 8 of the *Forest Act*. As such, I have recommended that First Nations consult with the district manager about the potential availability of undercut volume.

I would like to add, in relation to First Nations' generally expressed concerns of forest stewardship that in all AAC determinations I consider and account for stewardship issues associated with potential implications for timber supply. For instance by ensuring appropriate forest cover provisions for riparian areas, ungulate winter range, wildlife habitat, biodiversity at the stand and landscape levels through OGMAs, and other such objectives, all of which are routinely assessed in operations and in timber supply analysis, and accounted for as required by law. In situations where particular interests in stewardship are raised by a First Nation, I can then determine whether operational and analytical procedures are appropriate to address the interests raised, or whether further steps may be necessary to adequately address a particular interest and the impact my decision may have on that interest. Wherever reasonable and appropriate, I have accounted for such changes in practice and considered all of the input received from First Nations.

From all of the foregoing in this section, I conclude that reasonable efforts were made by district staff to inform First Nations about timber supply review and engage them in consultation regarding their aboriginal interests and how these interests may be affected by this AAC determination. A large amount of valuable information was received from First Nations and I acknowledge their concerns and interests; many of these concerns are being managed under the *Forest and Range Practices Act*, and objectives established under the *Land Use Act*, and accordingly have been incorporated into the analyses supporting my decision.

Based on my review of the consultation process and the aboriginal interest information available to staff and the potential impact my decision may have on these interests, the MNRO has engaged with First Nations at the normal level on the consultation spectrum as outlined in the *Haida* decision, which I believe to be appropriate. 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. If new information regarding First Nations' aboriginal interests becomes available that significantly varies from the information that was available for this determination, 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;

- alternative harvest flows

As discussed in the *Base case for the Kalum TSA*, the base case incorporated a harvest flow designed to maintain the current AAC for as long as possible, while providing for gradual transitions (not to exceed 10 percent per decade) in harvest level, with stable mid- and long-term harvest levels.

In addition to the base case, two alternative harvest flows (forecasts) were also prepared. The objective for the first alternative harvest flow was to find the maximum harvest level that could be maintained throughout the forecast period (maximum even-flow harvest). For the Kalum TSA the maximum even-flow harvest level is 400 558 cubic metres per year. This level is lower than the base case long-term harvest level, but above the base case mid-term harvest level, indicating that mid-term timber supply is a limiting factor.

The objective for the second alternative harvest flow was to maximize the first decade harvest level while maintaining the same harvest flow policy as in the base case. In this forecast, the maximum harvest level for the first decade is 478 667 cubic metres per year, which is 9.5 percent higher than in the base case.

I have reviewed the alternative harvest flow projections included in the analysis and conclude that the alternative harvest flows do not provide significant benefit in the mid- or long-term. All of the analyses presented in the timber supply analysis technical report have been helpful in identifying the advantages and shortcomings of various harvest flows. With the qualifications addressed in specific sections in this document, I am satisfied that the base case projection represents the most advantageous harvest forecast that achieves an appropriate balance between the short-, mid- and long-term harvest levels achievable in the Kalum TSA at this time.

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

Economic and Social Objectives

- economic and employment implications

According to the 2006 census, the population of the Kalum Resource District, which includes the Kalum and Nass TSAs, TFLs 1 and 41, and the Nisga'a lands, is approximately 30,400 persons. The major population centres of Terrace, Thornhill, and

Kitimat account for about 85 percent of the population. Smaller communities include Kitimaat Village, Kitsumkalum, Gitaus, Gitwinksihlkw, New Aiyansh, Rosswood, Usk and rural areas around Terrace.

The 2006 census indicates that the total population of the Kalum Resource District remained stable between 2001 and 2006. However, employment in the forest sector for the Kalum Resource District has declined by approximately 37 percent between 2001 and 2009 due in large part to the closure of two large sawmills in Terrace since 2006. Most recently, the pulpmill in Kitimat closed in 2010, leading to a further decline in the region's economy.

In 2006, the forest sector constituted approximately 14 percent of the basic sector¹ economy for the Kalum Resource District. In the time since the census was conducted additional mill closures will likely translate to a further decrease in this estimate. Despite these challenges, the communities in the TSA have long based their economy on natural resources, and forestry continues to factor prominently as an industry.

As previously discussed in the *harvest performance/undercut* section of this document, forest licensees have not harvested the full AAC of 436 884 cubic metres in recent years. The actual volume harvested in 2009 was approximately 114 947 cubic metres, or about 26 percent of the current AAC.

Concerns have been raised over the export of raw logs to foreign markets. Up to 30 percent of the volume harvested in the Kalum Resource District between 2005 and 2008 has been exported as raw logs to Japan, China, Korea and the USA as permitted under the Northwest Interior Log Export Order in Council (OIC). Unfortunately, a lack of sizeable primary processing facilities in the northwest has left licensees with few local consumers for their wood other than small niche markets. I also note that exporting logs provides local benefits and retains knowledge, skills and equipment for use when local opportunities return.

Additional public input was received in a letter dated May 14, 2010 from the Skeena-Nass Centre for Innovation in Resource Economics (SNCIRE), and in a letter dated May 14, 2010 from Kalum Ventures Ltd. (KVL). SNCIRE and KVL express concerns about setting the AAC below the base case level. They caution that such a move could lower the potential for current and future economic opportunities. SNCIRE and KVL draw reference to the significant impact forest sector jobs have on both the service sector and the economy as a whole.

I am mindful of the public input received surrounding the economic and employment implications of the AAC determination and have considered this information in making my determination.

¹ The basic sector is supported by income flowing into the region and includes direct activity associated with a particular sector (forestry, agriculture for example) and the resulting indirect activity supported by company purchases of goods and services. The basic sector is considered the driver of economic activity and growth in a region.

- *public input*

The data package was advertised and public input was invited from May 6, 2009 to July 6, 2009. A public discussion paper was advertised and public input was invited from March 10, 2010 to May 15, 2010.

Public input from these processes is noted and addressed in various sections throughout this rationale, and in my considerations and reasoning in this determination I have remained mindful of this input and of the need to balance and integrate social and economic as well as biophysical considerations, in consistency with the Minister's recommendation. I thank all those persons who have taken the time to provide me with their ideas and information.

- *Minister's letter*

The Minister of Forests, Mines and Lands (formerly 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. In my determination, I have been mindful of the need for the allowable harvest in the short term to remain consistent with maintaining the integrity of the timber supply projection throughout the planning horizon. 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 noted in Table 3, I accept that the factors related to this section of the *Forest Act*, were appropriately addressed in the analysis, and I will not discuss them further.

Reasons for Decision

In reaching my AAC determination for the Kalum TSA I have considered all of the information documented above and the factors required under Section 8 of the *Forest Act*, and I have reasoned as follows.

The March 2010 base case forecast projected that an initial harvest level of 436 884 cubic metres – the level of the current AAC – could be maintained for two decades before decreasing by about nine percent per decade to the mid-term harvest level of 353 876 cubic metres per year. In decade 10, the harvest level increases to the long-term level of 421 226 cubic metres per year.

In determining AACs, my considerations typically identify factors that, considered separately, indicate reasons why the timber supply may be either overestimated or underestimated in the harvest levels projected for various periods in the base case. Some

of these factors can be quantified and their implications assessed with reliability. Others may influence the assessment of the timber supply by introducing an element of risk or uncertainty, but cannot be quantified reliably at the time of the determination and must be accounted for in more general terms.

I am satisfied that the assumptions applied in the base case forecast for the majority of the factors applicable to the Kalum TSA were appropriate. The following is my consideration of the factors for which I consider it necessary in this determination to further take into account implications to the timber supply as projected in the base case forecast.

In my considerations for the Kalum TSA I have identified the following reason why the timber supply may have been *overestimated* in the 2010 base case projection:

- *volume estimates for existing stands*: accounting for the new inventory adjustments reduces the short-term harvest level by about 26 000 cubic metres per year or about six percent.

In my considerations for the Kalum TSA I have identified the following reason why the timber supply may have been *underestimated* in the 2010 base case projection:

- *log grades*: accounting for the 2006 log grade changes increases the base case short-term harvest levels by 3.2 percent.

In combination, accounting for *volume estimates for existing stands* and *log grades* results in about a three percent overestimation in the base case short-term harvest level.

In addition to the adjustments in the base case to account for the factors described above, I must also consider other information that increases the uncertainty surrounding the timber supply for the Kalum TSA. In this regard, I am mindful that there is considerable uncertainty concerning the economic viability of the timber in the Kalum TSA as described in the *physical and economic operability* section of this document.

I am also guided by the social and economic objectives of the Crown, as expressed by the Minister of Forests, Mines and Lands in his letter of July, 2006. In this letter, the minister stresses the importance of a stable timber supply to maintain a competitive and sustainable forest industry, while being mindful of other forest values. With this in mind, I do not want to unduly constrain future economic opportunities in the northwest by reducing the AAC to account for relatively recent downturns in the market. Resource markets are cyclical in nature, so decreasing the AAC significantly at this time in response to the recent harvest performance across the TSA could prove shortsighted if new opportunities for investment present themselves. If geographic areas continue to prove uneconomic over time then I will consider reducing the THLB or introducing a geographic partition in subsequent determinations.

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 the TSA by establishing an AAC of 424 000 cubic metres.

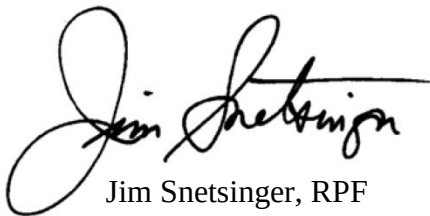
This determination is effective February 16, 2011 and will remain in effect until a new AAC is determined, which must take place within 10 years of the effective date of this determination.

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 MNRO staff and licensees to undertake the tasks and studies noted below that I have also mentioned in the appropriate sections of this document. I recognize that the ability of staff to undertake these projects is dependent on available staff time and funding. These projects are, however, important to help reduce the risk and uncertainty associated with key factors that affect the timber supply in the TSA:

- *monitor the spatial distribution of harvest over time*
I have instructed district staff to monitor the spatial distribution of harvest over the next 10 years relative to economic operability, to identify potential areas to be included in a partition or to be removed from the timber harvesting land base if necessary in the next AAC determination.
- *guiding principles for harvesting second growth in the TSA*
I am aware of the concerns surrounding the harvest of second-growth stands within the Kalum TSA. I therefore request that district staff work with TSA licensees and forest professionals to develop locally applicable guiding principles for the harvest of second-growth stands in the TSA.
- *monitor site losses due to debris piles*
I recognize that uncertainty exists surrounding the amount of productive area lost to roadside debris piles. I therefore request that district staff monitor debris piles across the TSA over time to evaluate whether the estimates of land base removals for roads, trails and landing used in this analysis need to be revisited in the next TSR.
- *cedar management strategy for the TSA/district*
In response to significant public input, I request that district staff work with First Nations to develop a Western redcedar management strategy for the Kalum Resource District.



Jim Snetsinger, RPF
Chief Forester



February 16, 2011

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 and Range Act*

Section 4 of the *Ministry of Forests and Range Act* (consolidated to March 30, 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 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 sectorin 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

Office of the
Minister

Mailing Address:
PO Box 9049 Stn Prov Govt
Victoria BC V8W 9E2
Telephone: 250 387-6240
Facsimile: 250 387-1040

Location:
Parliament Buildings
Victoria BC V8V 1X4
e-mail: FOR.Minister@gov.bc.ca



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