

British Columbia
Ministry of Forests, Lands,
and Natural Resource Operations

**Rationale for Increase in
Allowable Annual Cut (AAC)**

June 18, 2013

Innovative Forestry Practices Agreements

Issued to

ATCO Wood Products Ltd.
Stella-Jones Canada Inc.
Kalesnikoff Lumber Co. Ltd.
International Forest Products Ltd.
Tolko Industries Ltd.

**Effective
January 1, 2012**

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Regional Executive Director
Kootenay Boundary Forest Region**

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Executive Summary

Section 59.1 of the *Forest Act* enables the Minister of Forests, Lands and Natural Resource Operations (FLNRO) to increase the current allowable annual cut (AAC) associated with the licence of an Innovative Forestry Practices Agreement (IFPA) holder. An increase in AAC must be justified based on the IFPA holder documenting their innovative forestry practices or activities in an approved Forestry Plan and demonstrating the impacts of the practices on timber supply by methodology approved by the chief forester. The Minister has delegated the forestry plan and AAC increase decisions to the regional executive directors.

In the fall of 1998, the Minister of Forests signed innovative forestry practice agreements with 5 licensees in the Arrow TSA for a period of 10 years. These agreements were extended to December 31, 2015. The licensees work together as the Arrow Forest Licensee Group (AFLG).

In a letter dated September 29, 2011 AFLG requested that the Regional Executive Director (RED) consider continuing the AAC increase sum of 34 000 cubic metres per year that expired August 31, 2011. For this decision, the RED has reviewed the application, the associated information, and consulted with First Nations.

In this rationale, the RED determined that it is reasonable for a 22 000 cubic metres increase in the allowable annual cut of the IFPA holders' forest licences.

The 22 000 cubic metres awarded under Section 59.1 will be allocated as follows:

- A20191 – Tolko Industries Ltd. by 3 018 cubic metres per year
- A20192 – International Forest Products Ltd. by 6 343 cubic metres per year
- A20193 – ATCO Wood Products Ltd. by 9 616 cubic metres per year
- A20194 – Kalesnikoff Lumber Co. Ltd. by 2 201 cubic metres per year
- A20196 – Stella-Jones Canada Inc. by 822 cubic metres per year

The determination is effective January 1, 2012 and will remain in effect until December 31, 2015 unless otherwise determined.

Objective of this Document

This document is intended to provide an accounting of the factors that I, as Regional Executive Director of the Kootenay Boundary Region, have considered, and the rationale that I have used in making my determination, under Section 59.1 of the *Forest Act*, of a request to increase the base allowable annual cut (AAC) of the replaceable forest licences under Innovative Forestry Practices Agreements (IFPA) in the Arrow Timber Supply Area. Specifically, on September 29, 2011 the Arrow Forest Licensee Group on behalf of the licensees with IFPAs made an application to increase the AAC of their licences FL A20191, A20192, A20193, A20194 and A20196. Collectively, these IFPAs are referred to as the Arrow IFPA and the licensees involved as IFPA holders.

The document outlines the background of the Arrow IFPA, statutory framework, guiding principles for the determination, the role of timber supply analysis in the process, the consideration of factors influencing the timber supply analysis, impacts on other licensees, First Nations' considerations, reasons for decision, determination, conditions and recommendations. The appendices contain the IFPA legislation and memorandum from the chief forester on timber supply methodology. This rationale does not identify all the work completed by the IFPA holders, but is intended to address the AAC increase application and resulting determination needs.

Innovative Forestry Practices Agreements

Innovative Forestry Practice Agreements were signed in the fall of 1998 between the Minister of Forests and 5 licensees within the Arrow TSA: Slocan Forest Products Ltd (recently held by Springer Creek Forest Products and now held by International Forest Products Ltd), Atco Lumber Ltd. (now named ATCO Wood Products Ltd), Kalesnikoff Lumber Company Ltd., Bell Pole Company (now held by Stella-Jones Inc) and Riverside Forest Products Ltd. (now held by Tolko Industries Ltd.).

The Innovative Forestry Practices Agreements identify the requirements of the licensees which include:

- preparing a forestry plan every 5 years
- soliciting comments from identified stakeholders around a forestry plan
- providing a base-level AAC for the IFPA plan area using methodology approved by the chief forester
- providing an annual report

The agreement identifies that the statutory decision maker (SDM), upon receiving a forestry plan (of which an AAC application is considered to be part), shall approve or state reasons for not approving a forestry plan within 6 months of receiving the plan.

The agreements signed in 1998 were for a 10 year term. In January 2007, the Minister of Forests and Range enabled the extension of agreements to August 31, 2011. Subsequently the Regional Executive Director amended the Arrow IFPA agreements in December 2011, extending them to December 31, 2015.

Description of Innovative Forestry Practices Agreement Area

The Arrow IFPA covers the total 605 600 hectares of the Arrow Timber Supply Area (TSA) of which 81.4% (493 000 hectares) is considered productive forest. The operable forest makes up 48% (290 600 hectares) of the total area. Approximately 34.7% of the total TSA land base or 42.6% of the productive forest land base is considered timber harvesting land base (THLB). The Arrow TSA is administered by the Selkirk Natural Resource District.

The TSA primarily consists of the Interior Cedar-Hemlock and Engelmann Spruce Subalpine Fir biogeoclimatic zones. Douglas-fir and subalpine fir (also known as balsam) are the most common leading species within the TSA but lodgepole pine, western larch, Engelmann spruce and western hemlock leading stands are prevalent as well.

Natural resources in the TSA include timber, fish and wildlife, recreation and tourism, and water. The diversity of wildlife is impressive: most of the ungulate species present in BC are found in the TSA including bighorn sheep, caribou, elk, moose, mountain goats, mule and whitetail deer.

The Arrow TSA is within the Kootenay-Boundary Higher Level Plan (KBHLP). Management objectives are identified within the KBHLP Order of October 26, 2002 and associated variances. The KBHLP Order addresses objectives for biodiversity, old and mature forest, caribou, green up, grizzly bear habitat and connectivity corridors, consumptive use streams, enhanced resource development zones, fire maintained ecosystems, and social and economic stability. Other non-timber management objectives such as visuals are addressed through objectives under the *Government Action Regulation* and other management mechanisms.

Nearly 44 000 people reside in or near the TSA with about 40 percent of the population living in Castlegar, Trail and Rossland. Other communities include Fruitvale, Montrose, Nakusp, New Denver, Salmo, Slocan, Silverton and Warfield.

The forest sector accounts for about 20 percent of total employment in the Selkirk Natural Resource District with other major sectors consisting of tourism and the public sector.

Statutory Framework

Section 59.1 of the *Forest Act* enables the minister to increase the current allowable annual cut associated with the licence of an innovative forestry practices agreement holder. Prior to such approval, the minister must have approved a Forestry Plan in which the innovative forestry practices or activities are identified. The minister has delegated these responsibilities to the regional executive director.

Eligible categories of innovative forestry practices and activities are described in the Innovative Forestry Practices Regulation. These categories include improvements due to harvesting or silvicultural systems, silvicultural treatments, collection and analysis of new data on forest composition and expected growth, and management activities to enhance and protect other resource values. To be eligible, the practices and activities must be within the Forestry Plan approved by the regional executive director. The collection and

analysis of new data must be in accordance with the available specifications of the chief forester.

An increase in AAC must be justified based on timber supply analysis methodology approved by the chief forester. The chief forester has made known his approved timber supply analysis methodology in a memorandum dated April 6, 2001 to the regional managers. This memorandum provides the general principles of the timber supply analysis methodology that is required.

Under section 59.1 of the *Forest Act*, the SDM can limit an AAC increase to a period of time, area of land, type of timber or any other condition. The SDM can also reduce or eliminate an increase at any future time given new information or for non-compliance with the Forestry Plan or the conditions set. Further, the SDM is enabled to suspend or cancel an innovative forestry practices agreement if the holder is not complying with the agreement, Forestry Plan, conditions, *Forest Act*, or *Forest and Range Practices Act*.

Section 59.1 of the *Forest Act*, the Innovative Forestry Practices Regulation, and the memorandum on timber supply methodology from the chief forester, are reprinted in the appendices.

Guiding Principles

Fairness and Consistency

I expect to make this single determination under section 59.1 of the Forest Act with respect to increases of AAC for licensees with IFPAs. To ensure administrative fairness and a reasonable degree of consistency across regions, I have outlined some central principles that are common to such decisions and will guide my approach. In specific circumstances, should I consider it necessary to deviate from these principles, I will explain my reasons.

Professional Designation

A significant component of the information presented within the application for an AAC increase under Section 59.1 is within the professional forestry realm identified within the Foresters Act. While I am a registered professional forester, I must also rely on the assessment provided by professionals who prepared the application and my professional staff who present the information to me.

My professional staff will provide three roles with respect to the application.

1. First they review and comment on the application to ensure its sufficiency for a determination.
2. Secondly, they collate information presented in the application, add supplementary information and provide professional assessments to assist my understanding and assessment of the application.
3. Thirdly, my staff will provide professional advice to me with respect to my rationale for the decision that I make.

My professional staff will also provide me with advice that I may consider regarding Innovative Forestry Practices Agreement legislation and any associated government policies and initiatives.

Innovative Forestry Practices or Activity

For an innovative forestry practice or activity to be considered in a Section 59.1 AAC increase determination, the practice or activity must be either currently implemented or the plans for the practice must be clear, practical, and feasible. Given the nature of innovative forestry practices, I accept that some practices may be at an initiation stage rather than fully implemented.

Innovative forestry practices or activities identified in the approved forestry plan but which are not present in a Section 59.1 AAC increase application, may be considered in the Section 59.1 AAC increase determination if that practice or activity may significantly influence information presented in the application.

The benefits of innovative forestry practices and activities will not be considered under a Section 59.1 AAC increase determination from areas that are temporally excluded from the IFPA area (e.g., timber licences) or excluded from the IFPA holder's replaceable forest licence (e.g., certain timber types).

Government Policy Considerations

A Section 59.1 AAC increase determination will not be based on proposed policy changes. While I may be aware of proposed policy changes that could impact an AAC increase decision, I must be mindful of the ever changing nature of proposed policy and I will not speculate on the acceptance of proposed policy. Similarly, it would be inappropriate for me to speculate on the impacts of strategic land-use or treaty processes before the decisions have been made by government and the appropriate implementation details have been determined.

Uncertainty and Risk

Uncertainty exists in the data and management practices presented and modelled in a review of timber supply. In my decision, I must consider this uncertainty and associated risks and, where necessary, I can account for such.

Stakeholders

With respect to First Nations' aboriginal interests, I am aware of the Crown's legal obligations resulting from current government policies. My determination should not in any way be construed as limiting the Crown's legal obligation, and in this respect it should be noted that my determination does not prescribe a particular plan of harvesting activity within an IFPA area.

A Section 59.1 licensee AAC awarded must not cause what in my opinion is a significant negative impact on non-IFPA licensees operating within the IFPA area boundaries.

An increase in timber supply associated with innovative forestry practices carried out under the IFPA forestry plan within the IFPA area can be attributable to the IFPA holder, even if the activities are undertaken by a non-IFPA holder.

A non-IFPA holder is not eligible for any Section 59.1 AAC increase, as this is not permitted under legislation.

Other Statutory Decisions and Obligations

My acceptance of information on practices within this decision does not supersede or fetter other statutory decision-making authorities, and is not to be construed as approval required by any other authority or agency.

In making my decision, I am aware of my obligations as a steward of the forests of British Columbia and of the mandate of the Ministry of Forests, Lands and Natural Resource Operations as set out under the relevant legislation.

Information Sources

In making this decision, I have considered information from a variety of sources. Many of these sources were used to compile a technical summary of the application that was presented to me on February 19, 2013.

- Ministry of Forests, Lands and Natural Resource Operations (unpublished). Technical Summary of the Arrow Forest Licensee Group Innovative Forestry Practices Agreement Request for an Allowable Annual Cut Increase. February 19, 2013. Castlegar, British Columbia

This technical summary was my primary source for reviewing the application; the document refers to other sources of information including those listed below that I have used to support my determination.

- De Jong, M., S. Hagan, and R. Neufeld. 2002. Kootenay-Boundary Higher Level Plan Order. Order establishing resource management zones and resource management zone objectives within the area covered by the Kootenay-Boundary Land Use Plan as a higher level plan pursuant to Sections 3(1), 3(2), and 9.1 of the Forest Practices Code of British Columbia Act. October 26, 2002. Victoria, BC.
- Forest Analysis and Inventory Branch. 2012 Monitoring harvest activity across 28 mountain pine beetle impacted management units. BC Ministry of Forests, Lands, and Natural Resource Operations, Victoria BC. 35p.
- Integrated Land Management Bureau. 1997. Kootenay Boundary Land Use Plan Implementation (June 1997). <http://www.ilmb.gov.bc.ca/sites/default/files/resources/public/PDF/LRMP/Kootenay%20Boundary%20Land%20Use%20Plan%20Implementation%20Strategy.pdf>
- Integrated Land Management Bureau. Kootenay Boundary Higher Level Plan Order Variances. <http://www.ilmb.gov.bc.ca/slrp/lrmp/cranbrook/kootenay/legaldocuments/variances.html>

- Konkin, D. 2009. Order – Ungulate winter range U-4-014. Mountain Caribou – Central Kootenay Planning Unit. Ministry of Natural Resource Operations, Victoria, BC
- Konkin, D. 2010. Order – Amendment to ungulate winter ranges U-4-012 U-4-013 and U-4-014. Ministry of Natural Resource Operations, Victoria, BC
- Ministry of Forests and Range. 2011. Vegetation Resources Inventory VRI Sample Data Analysis Procedures and Standards – Version 1 (June 2011)
- Ministry of Forests and Range. 2007. Technical summary of the Arrow Forest Licensee Group Innovative Forestry Practices Agreement request for an allowable annual cut increase. October 3, 2007. Arrow Boundary Forest District, Ministry of Forests and Range, Castlegar, BC. 181p.
- Nienaber, G. 2004. Timber supply analysis report. Timber Supply Review 2003/2004 Arrow Timber Supply Area. Revision Number 2 – Public Review Draft. April 2004. Timberline Forest Inventory Consultants Ltd., Victoria, BC. 70p.
- Ozanne, R.K. 2011. Arrow IFPA – Forestry Plan Amendment and Application for Continuance of AAC Uplift. Letter to Tony Wideski September 29, 2011. ATCO Wood Products, Fruitvale, BC.
- Province of British Columbia. 2007. TIPSy version 4.1d. Research Branch, Ministry of Forests. Ministry Standard Database, October 2006.
- Province of British Columbia. 2007. RESULTS (Reporting Silviculture Updates and Land status Tracking System) version 04.02.01.
- Snetsinger, J. 2005. Arrow Timber Supply Area – Rationale for Allowable Annual Cut (AAC) Determination. Ministry of Forests, Lands and Natural Resource Operations, Victoria, BC 52p.
- Timberline Forest Inventory Consultants Ltd. 2004. Data Package Timber Supply Review 2003/2004 Arrow Timber Supply Area. June 2004. Kelowna, BC. 73 p.
- Timberline Forest Inventory Consultants Ltd. 2005. Supplemental ungulate winter range analysis. Draft version 1. Timberline Forest Inventory Consultants Ltd., Victoria, BC.
- Timberline Forest Inventory Consultants Ltd. 2006. Timber supply analysis report Arrow Innovative Forestry Practices Agreement Support and Analysis for Uplift Application. October 2006. Kelowna, BC.
- Trumpy, C. 2007. Order – Ungulate winter range #U-4-001 – West Kootenay (Arrow TSA, Kootenay Lake TSA, Revelstoke TSA, TFL 3, TFL 23). Ministry of Environment, Victoria, BC.
- Zacharatos, T.P. 2005. Okanagan TSA Innovative Forestry Practices Agreements Rationale for Increase in Allowable Annual Cut (AAC) Determination. Ministry of Forests, Lands, and Natural Resource Operations, Southern Interior Forest Region, BC.
- Zacharatos, T.P. 2008. Rationale for Increase in Allowable Annual Cut (AAC). Revised January 9, 2008. Innovative Forestry Practices Agreements Issued to ATCO

Wood Products Lt., Bell Pole Canada Inc., Kalesnikoff Lumber Co. Ltd., Springer Creek Forest Products, Tolko Industries Ltd. Effective January 1, 2008. Ministry of Forests, Lands and Natural Resource Operations, Southern Interior Forest Region, BC

Forestry Plan

The regional manager of the Nelson Forest Region approved the first forestry plan submitted by AFLG on June 11, 1999 for the period June 3, 1999 to June 2, 2004. Numerous Forestry Plan updates were submitted and approved between 1999 and 2008. The last plan was approved by regional manager of the Southern Interior Forest Region with an expiry date for the plan of August 31, 2011

On September 29, 2011 the AFLG submitted an updated forestry plan and a request for uplift continuance to the Regional Executive Director of the Kootenay Boundary Region.

Ministry staff have consulted First Nations on the forestry plan. No issues specific to the forestry plan were identified, however, considerations around the allowable annual cut increase request were expressed (See Section on First Nations consultation)

As part of a requested public review process, AFLG published a notice in the newspaper inviting the public to review and comment upon the plan. No comments have been received from the public.

Ministry staff have reviewed the plan and found that the AFLG have provided an update for the main section of the forestry plan describing the IFPA holders' objectives, management, and communication structure, a work plan for 2011-2015, and supporting timber supply analysis.

The following are the activities in the 2011 – 2015 Forestry Plan all of which were subject to availability of funding:

- Support for the Okanagan Sustainable Forest Management Public Advisory Group
- Support FLNRO staff in Assisted Migration trials
- Participate in Broadleaf Management trial
- Fish Passage works
- Forests for Tomorrow
- Yellow Cedar provenance trial re-measurement
- Western Larch Realised genetic gains trial re-measurement
- IFPA website

The current forestry plan does not provide as detailed a description of projects as found within the initial forestry plan.

Approval of the forestry plan contained within the September 29, 2011 application is necessary prior to a decision on an AAC increase. This approval will need to recognize the initial innovative forestry practices that have been completed and that the related background information contained within the June 3, 1999 forestry plan and appendices are still valid components of the forestry plan.

The previous IFPA AAC increase rationale identified four recommendations for the IFPA group to work on during the term of the agreement. These were:

- *Site productivity estimates:* that site productivity in managed stands be monitored and that additional efforts be made to improve the quality and reliability of Predictive Ecosystem Mapping (PEM)
- *Wildlife tree patches:* that wildlife tree retention in the timber harvesting land base be monitored and reported.
- *Twenty year plan:* to update the plan so that cut levels can be spatially validated before the next determination.
- *Mountain pine beetle:* I expect that licensees will use the uplift to address these stands and I ask that BCFS district staff monitor performance in that regard.

The IFPA Forestry Plan discussed these points and gave suggestions as to how they could be resolved. With regard to site index issues, they suggest that because there is a lack of funds and an ongoing review of biogeoclimatic mapping it is not feasible to work on the PEM. The forestry plan said that silviculture history records could be used to monitor site productivity.

The AFLG suggests that the FLNRO Forest and Range Evaluation Program (FREP) program is adequately monitoring wildlife tree patches. No action plan was put forward.

The twenty year operational feasibility plan was developed in 2006 and subsequently revised in the fall of 2007 to respond to issues raised by ministry staff. District staff indicate that they still believe the revised plan is inadequate.

To address the mountain pine beetle recommendation the licensees focused harvesting within pine types and demonstrated such within submitted pine harvest statements showing a harvest that favoured pine. Most licensees reported on their performance, and the proportion of pine volume harvested has been greater than the pine component for most licensees.

A final concern is that the AFLG has not successfully implemented a viable monitoring program that meets the stated objectives of the forestry plan. Section 5.3 of the Forestry Plan states that they will monitor the currency of the Vegetation Resource Inventory in conjunction with the second AAC harvest increase.

Overall the AFLG has taken action on only one of the recommendations put forward by the RED from the previous uplift. The reasons given for the lack of progress are a lack of funding and other constraints. I recognize that these were recommendations and not conditions of the previous AAC increase determination.

I find the Forestry Plan meets the legislated requirements and therefore I approve the Forestry Plan as submitted September 29, 2011 for the Arrow IFPA with the application for an AAC increase.

Allowable Annual Cut Increase Application

In a letter dated September 29, 2011 the AFLG applied to the regional executive director for a continuance of the allowable annual cut increase on behalf of the forest licensees with innovative forestry practices agreements in the Arrow TSA. The application requested that the regional executive director consider a continuance of the increase granted on January 9, 2008.

The application, which included an updated forestry plan, identified current IFPA projects, management and communication, a description of key issues, detailed accounting of past IFPA projects, licensee statements regarding Mountain Pine Beetle harvest, and a summary of changes since the 2008 AAC increase was granted.

Changes since the 2008 AAC increase, as listed in Appendix 10 of the Forestry Plan, are as follows:

- The MFLNRO regional inventory forester completed a VRI validation exercise.
- There were two major fires in the TSA, impacting approximately 1% of the THLB.
- The old growth management area (OGMA) coverage was corrected.
- A Government Actions Regulation (GAR) Order for Caribou was established, excluding approximately 12 000 hectares of THLB from harvest.
- A GAR order was established to protect grizzly bear habitat. The general wildlife measures in the order exclude only minimal areas from harvesting.
- Global economic conditions have resulted in slowdowns and stoppages for some forestry operations.

The application did not include any new information about the existing innovative forestry practices.

In a letter dated October 13, 2011, I requested that the AFLG share information about the application with First Nations, and enable First Nations a 60 day period for response.

The Role of Timber Supply Analysis

Section 59.1(7) of the *Forest Act* identifies that an increase in allowable annual cut must be justified according to timber supply analysis methodology approved by the Chief Forester. The Chief Forester has made known this methodology in a memorandum dated April 6, 2001. The memorandum provides the general principles, not detailed procedures, of timber supply analysis required to assist my decision.

The timber supply analysis consists of two components. The first component is an information package that includes information from three categories: land base and inventory; timber growth and yield; and management practices. The second component is a suite of timber supply forecasts based on the information package that investigates different harvest flow options and data uncertainty.

To determine an increase in AAC requires that I have both knowledge of timber supply based on current practices and of the changes associated with the IFPA innovative practices and activities. As such, the timber supply analysis provides separate forecasts without and with the innovative forestry practices and activities.

For the current AAC increase application, I made use of timber supply analysis provided by AFLG. This analysis was also used within the AAC increase application of December 29, 2006 and the 2004 timber supply analysis provided for the chief forester's 2005 AAC determination in the Arrow TSA. This later analysis was provided to the chief forester by the licensees that comprise the AFLG.

The timber supply analysis with which I am provided is an integral component to my review of the AAC increase application. However, the determination itself is not a calculation but a synthesis of judgement and analysis in which numerous risks and uncertainties are weighed. Analytical methods such as forest estate models cannot incorporate all the social, cultural, and economic factors that are relevant when making forest management decisions. As such, depending upon the outcome of these considerations, the increase in AAC determined may or may not coincide with harvest flows identified in the timber supply analyses.

In this rationale, I will not discuss in detail many of the timber supply analysis assumptions or factors where I am satisfied that such are appropriately considered and are documented within the timber supply analysis reports.

Consideration of Factors

I have reviewed the IFPA holders' application including the timber supply analysis for the proposed allowable annual cut increase. My decision process for an allowable annual cut increase consists of two steps. The first step is the confirmation that the proposed practices can be considered innovative forestry practices as defined by regulation. The second step is to determine, as justified by the timber supply analysis methodology, an increase in harvest flow attributable to the innovative forestry practices.

Below I follow the above 2 steps where I first discuss my interpretation of the innovative forestry practices proposed and then secondly I comment on the timber supply analysis and information that was used to assess increases in harvest flow. For the analysis

assessment, I will only discuss factors that affect the decision or need elaboration due to concerns expressed.

Innovative Forestry Practices

Since the inception of the IFPA the AFLG has completed a variety of projects that could be considered innovative forestry practices or activities.

Prior to the 2005 Chief Forester AAC determination, AFLG had completed projects such as:

- VRI Phase I
- Predictive Ecosystem Mapping (PEM)
- SIBEC sampling

Prior to the 2008 Section 59.1 licence AAC increase determination, AFLG had completed

- VRI Phase 2 and NVAF

Funding for the Arrow IFPA has declined significantly in recent years. The licensee group has not undertaken any new projects in the years since the 2008 uplift was granted.

The VRI is the standard BC vegetation resource inventory. The Phase 1, which is the main forestry inventory, is an aerial photo interpretation of the vegetation. The Phase 2 is a ground sample that can verify or be used to adjust the attributes in Phase 1. NVAF is net volume adjustment factor component of the VRI which is a more detailed sampling of individual trees to determine an adjustment factor to account for items such as decay.

The AFLG initiated and contracted all phases of the VRI except the initial aerial photography

- The VRI Phase I for the Arrow TSA was conducted and completed in 2002.
- VRI Phase 2 ground sampling with destructive sampling for Net Volume Adjustment Factors (NVAF) was completed in 2004 and 2005.
- Analysis and the derivation of an adjustment factor were completed in 2006.

Predictive Ecosystem Mapping is the use of modelling tools to predict site series, which is an ecological classification for all sites within a biogeoclimatic subzone or variant that are capable of producing the same mature or climax vegetation unit (plant association).

SIBEC sampling is the field collection of site index and site attributes that contributes to the ministry's SIBEC data base. This data base in conjunction with site series mapping is used to predict the productivity of a site, as measured by site index.

The AFLG initiated and managed the PEM and collected local SIBEC data to add to existing provincial data base. The PEM assessment data did not meet the full requirements for independent quality assessment, however, at the time; Ministry staff provided a qualified acceptance for use at a strategic level such as the timber supply review.

- AFLG collected 34 unique site series/leading species combinations for SIBEC use

- No updating of this information has occurred since previous Section 59.1 decision.

In the current application, the VRI Phase 2/NVAF project is identified as an innovative forestry practice to support an increase in harvest flow. The VRI Phase 1 and the PEM/SIBEC projects are not used to support the identified increase in harvest flow; however these projects, which support the current allowable annual cut in the Arrow TSA, are incorporated within the timber supply analysis provided with the application.

My guiding principles infer that activities proposed as innovative forestry practices be identified within the approved Forestry Plan. The above practices, in particular the VRI Phase 2 and NVAF are present within the submitted Forestry Plan as well as the December 2006 forestry plan.

I find that the VRI Phase 2 and NVAF projects could be considered innovative forestry practices as defined under section 2(e) of the Innovative Forestry Practices Regulation. All these projects provide information or analysis that will result in a more accurate representation of the forest composition.

I will further discuss these factors in the relevant sections below and discuss my decision on an allowable annual cut increase attributable to these innovative forestry practices within my reasons for decision.

Timber Supply Analysis

The analysis AFLG provided for their 2011 uplift continuance application is the same timber supply analysis that was the basis of the 2008 Section 59.1 AAC increase.

The main documents that describe the timber supply analysis are (1) an October 2006 timber supply analysis report (2) an April 2004 analysis report for the Arrow TSA with an appended data package and (3) an earlier draft of the October 2006 timber supply analysis that included scenarios for proposed caribou management.

The October 2006 timber supply analysis is an update of the timber supply analysis that supported the July 2005 chief forester AAC determination. The AFLG, under the auspices of the ministry's defined forest area management (DFAM) initiative in place at the time, had administered this analysis.

Ministry staff identified that the timber supply analysis generally follows the chief forester's methodology documented in a memo to regional managers on April 6, 2001.

The base case presented to the Chief Forester in his 2005 Section 8 decision (TSR 3) which included earlier innovative forestry practices conducted by AFLG (e.g., VRI Phase I, PEM, SIBEC) was considered the base for which to compare against the scenario that included the VRI phase 2 and NVAF projects. The 2005 Section 8 base case will be referred to as the base case scenario and the scenario in which the VRI Phase 2 and NVAF projects are included will be referred to as the uplift scenario.

The timber supply analysis was completed using the CASH6 model of the Timberline Forest Inventory Consultants Ltd. The 2004 timber supply analysis base case was completed by Gordon Nienaber, FIT and the 2006 analysis that provided the uplift scenario by Kelly Sherman, RPF.

The base case scenario indicated that a harvest flow of 550 000 cubic metres per year could be maintained for seven decades, followed by a substantial 25 percent increase in the eighth decade to a long-term maximum sustainable harvest flow of 690 000 cubic metres per year. The long-term increase primarily reflects the use of improved site productivity estimates and genetic gains for managed stands that are projected to result in higher productivity.

The uplift scenario employed the findings of VRI Phase 2 and NVAF sampling and subsequent adjustments to the Phase 1 inventory. The uplift scenario indicates that an initial harvest level of 640 000 cubic metres per year can be maintained for seven decades before a long-term harvest level of 690 000 cubic metres is attained in decade eight similar to the base case. The initial harvest levels are 90 000 cubic metres above the base case and this finding forms the basis for the AAC increase application submitted by IFPA holders.

The IFPA holders, in addition to the base case and uplift scenarios provided several sensitivity analyses to assist my decision. These sensitivity analysis include concerns around Mountain pine beetle, old growth management areas, and caribou.

I am satisfied that the methodology used in the timber supply analysis that supported the application for an AAC increase sufficiently meets the needs identified in the chief forester's April 6, 2001 memo on timber supply analysis methodology related to innovative forestry practices agreements (see Appendix 3).

Decision Base

Under section 59.1 of the Forest Act, I am enabled to increase the allowable annual cut authorized in a licence whereas the chief forester's decision under Section 8 is to determine the allowable annual cut of a management unit. While these decisions may use similar information, they are different decisions.

For this decision, which is an increase in the AAC of a licence, I need to identify a base to which to compare the impact of the innovative forestry practices. For this base, the licensees have presented me with the base case used by the chief forester to determine the current AAC for the Arrow TSA. I find that this is a reasonable base for use in support of my decision. However, I also recognize that the chief forester identified uncertainties in the information that either positively or negatively impacted the base case harvest flow.

For my decision, I also must consider how information presented to me may affect the base case scenario. I may not view the information similar to the chief forester or I may be presented with updated information that would influence my decision. Changes in information relative to this decision will affect the starting point that I consider for identifying a harvest flow increase.

Similarly I must also consider the affects of new information on the uplift scenario that included the updated VRI information which was used to justify the harvest flow increase. Subsequent changes in land base, forest productivity and non-timber resource constraints used in that analysis will also influence the harvest flow increase proposed by the IFPA-holder.

In the “Reasons for Decision” I will account for changes in the Section 8 AAC determination and the harvest flow increase analysis separately for the sake of clarity.

Factors Not Discussed

The following factors from the chief forester’s Section 8 AAC determination were considered to be unchanged and are not discussed in this rationale. Information on these factors are available with in the documents supporting the analysis and the Section 8 AAC determination.

Environmentally Sensitive Areas	Decay, Waste and Breakage
Low sites	Minimum harvestable ages
Unmerchantable Forest Types	Harvest Sequence
Deciduous Forest Types	Cutblock Adjacency
Existing and future roads, trails and landings	Visually sensitive areas
Timber License Reversions	Identified Wildlife
Protected Areas	Genetic resources
Operational Adjustment Factors	Grizzly Bear
Regeneration Delay	Wildlife Management Area
Impediments to prompt regeneration	Riparian and fish bearing streams
NSR and backlog	Stand level biodiversity
Silviculture systems	Slocan Valley
Incremental silviculture treatments	Cultural heritage resources

I have reviewed these issues and concur with staff that these factors do not affect my decision regarding the License AAC increase.

Factors to be Considered

Since the chief forester’s Section 8 AAC determination and since the previous Section 59.1 AAC increase determination, there have been changes to a number of factors. Below I discuss the following factors that have changed or for which an issue has been raised that may influence my determination of an allowable annual cut increase for the IFPAs.

Operable Land Base

The most recent operability mapping was completed in 1991 for the entire TSA, with a minor update in 1998. In the most recent timber supply reviews (TSR) for the Section 8 AAC determination, district staff expressed concern that some of the operable area should not have been included, in particular small slivers of operable areas that are isolated by previous harvesting and unlikely to be harvested in the first rotation. New slivers of timber continue to be created resulting from mature plus old requirements and economics.

Since the previous IFPA uplift decision, district staff have expressed concerns that harvest on steep slopes is not keeping pace with the amount of steep slope on the land base. At the present time no work has been done to quantify this downward pressure.

It was concluded in TSR 3 that the THLB is overestimated by about 0.5% as a result of these inoperable slivers and district staff still consider the 0.5% an appropriate estimate.

I reviewed this concern with district staff and consequently I find that there is a small (~0.5%) downward pressure across all forecast horizons of the base and uplift scenarios. I have therefore taken this overestimation into account in my “Reasons for Decision”.

Woodlot Licences

The total woodlot area has increased by 510 hectares since TSR 3 due to area top-up of existing licenses. The woodlot land base tends to be highly operable; therefore it can be assumed that it is equivalent to 500 hectares of THLB (0.2% of TSA THLB). Woodlots do not contribute to the TSA timber harvesting land base nor do they contribute to meeting forest cover requirements in the TSA timber supply analysis so this area removal has a direct impact on both the base and uplift scenarios. Further as this volume is no longer accessible to the IFPA holders, it will impact the harvest flow increase.

This results in a 0.2% downward pressure on the harvest flow increase across all forecast horizons for the uplift request. I have therefore taken this overestimation into account in my “Reasons for Decision”.

Community Forests and Cascadia TSA

Community forests do not contribute to the timber supply available to the forest licences of the IFPA holders, as such, I do not consider them to contribute to a Section 59.1 AAC increase.

Two community forests agreements (CFA) have been established since the previous Section 8 AAC determination and were not included in the timber supply analysis. This area of the approved community forests is approximately 25 014 hectare which equates to 5.1% of the crown forest land base of the Arrow TSA or 9.4% of the timber harvesting land base.

A further land base removal from the Arrow TSA was the creation of the new Cascadia TSA. However, most of the Cascadia TSA was created from areas formerly in TFL23 and only a small area of 282 hectares was transferred from the Arrow TSA .

In the Section 8 AAC determination, as the community forests were not in the base case of the timber supply analysis, the chief forester accounted for the CFAs with a 7% downward pressure. The Cascadia TSA was not considered in the Section 8 AAC determination.

In my “Reasons for Decision” I recognize the 9.4% downward pressure on the harvest flow increase across all forecast horizons and I am mindful that the most recent Section 8 AAC determination accounted for the presence of the CFAs.

Forest Inventory

The AFLG has completed a Vegetation Resource Inventory (VRI) for the Arrow TSA. VRI Phase I was conducted and completed in 2002. VRI Phase 2 ground sampling with destructive sampling for Net Volume Adjustment Factors (NVAF) was completed in 2004 and 2005. The analysis and derivation of an inventory adjustment factor was completed in 2006.

The VRI Phase 2 and NVAF identified a 16.4% higher volume than the VRI Phase I estimates. Application of an adjustment to the inventory attributes results in a 90 000 cubic metre increase in the short-term timber supply.

The AFLG initiated and contracted all phases of the VRI except the initial aerial photography which was flown in 1998 by the Ministry. The VRI Phase I (photo interpretation and labelling) for the entire TSA was completed in 2002 by AFLG contractors. Quality assurance by the Ministry found that all work met standards.

District staff comment that the Section 59.1 AAC increase request is entirely predicated on the results of the VRI Statistical Adjustment. Within the Phase 2 report, it is recommended that further work be done on the NVAF as there is considerable bias associated with either the unadjusted inventory attributes and/or the VDYP estimates of volume. No further work has been done since the report to address the uncertainty

All the analysis carried out by the AFLG used VDYP6.6d to estimate stand volumes. Current inventory estimates and timber supply projections recommended the use of VDYP7 which in a 2009 comparison showed about 8.5% higher volume estimates than VDYP6 in the Arrow TSA.

In conclusion, the VRI Phase 1, Phase 2, NVAF, and subsequent analysis have followed appropriate standards of the day but some methodology changes and uncertainty within the data are recognized.

In the 2005 Section 8 AAC determination, the Chief Forester recognized a significant unquantified upward pressure on short- and mid-term timber supply when he compared the 2002 VRI phase 1 and the 1995 audit of the previous forest inventory. At that time the IFPA holders were in the process of completing the VRI Phase 2 and NVAF. The Chief Forester expected conservatively the underestimation of the VRI Phase 1 to be at least 10 percent and considered such in his determination.

Given that the Chief Forester considered an upward pressure of 10% in his AAC determination, only 6.4% of the current 16.4% increase due to the VRI Phase 2 innovative forestry practice can be considered incremental to the IFPA holders current

licence allowable annual cut. In other words, 55 000 cubic metres of the observed harvest flow increase of 90 000 cubic metres is already supporting the current Section 8 AAC and subsequently the base allowable annual cut of the forest licences of the IFPA holders. Thus the observed short term harvest flow increase that should be available for a Section 59.1 AAC increase is only 35 000 cubic metres rather than 90 000 cubic metres (i.e., a 61% decrease).

No future work is identified by the IFPA holders to maintain or enhance the VRI work completed.

In conclusion, I find that much of the identified harvest flow increase resulting from AFLG's inventory work has been incorporated into Section 8 AAC of the Arrow TSA upon which the existing allowable annual cut of the forest licensees of IFPA holders is based. I have taken this overestimation into account in my "Reasons for Decision".

Site Productivity

The productive potential of a forest stand to grow timber is expressed through its site index assignment and is the most common measure of site productivity worldwide.

Site index is determined using the height and age of a stand's largest trees coupled with site index equations that put all stands on a relative basis for comparison i.e., height expected for the dominant trees within a stand at breast height age 50.

In general in British Columbia, the forest inventory based site indices determined for old stands tends to be an unreliable measure of growth under management as the stands may have grown under intense competition or may have been damaged, and therefore may not reflect the true growing potential of the site. This has been verified in numerous studies in the province such as the Old-Growth Site Index (OGSI) project.

Young stands can also have unreliable site index estimates associated with them as they often have site index values originating from the old stand that predated them or the stand may be too young to obtain a reliable site index value.

For the base case scenario analysis, site index values for existing unmanaged stands were calculated from the new VRI phase 1 inventory height and age. Following harvest, these stands were assigned a site index based on site index estimates for site series (SIBEC information) coupled to a Predictive Ecosystem Map.

District staff indicate that there is uncertainty in the PEM, although approved for TSR the Section 8 determination identified qualifications and recommendations for improvements of the PEM. The uncertainty in site series assignment leads to uncertainties in the site index assignments. However, while I am mindful of the uncertainty around the PEM, I recognize that the major influence on timber supply of such differences in site productivity estimates will be around the mid- and long- term.

In reviewing this factor with FLNRO staff, I accept that the site productivity estimates applied reflect best available information.

Grade 4 Credits

Licensees can generate a credit on their allowable annual cut control where Grade 4 logs are sent to a non-lumber facility. The intent of this program is to encourage utilization of low economic stands of beetle killed pine stands. In the last year four licensees have taken advantage of this credit for a total volume of 120 000 cubic metres.

Grade 4 fibre would largely have been considered part of inventory volumes within the timber supply analyses of the most recent timber supply review and the Section 59.1 AAC increase application.

Non-accounting of the Grade 4 volumes against the allowable annual cut could create a potential pressure on the available volume in the TSA. However, the impact of Grade 4 credits depends on whether the full apportionment is being cut and the future usage of these credits.

Currently, in the Arrow TSA there is an undercut that would balance some of the Grade 4 volume, assuming the undercut is not placed in another tenure. If the credits continue at the current level since the program initiation (e.g., about 30 000 cubic metres per year), there will be a comparable mid-term impact on the timber supply, however, if there is the expected decrease in such credits, the impact will be less.

While I mindful of the issue of Grade 4 credits, there is no implication on the harvest flow increase attributable to the innovative forestry practices; unless the incremental harvest resulting from the Grade 4 policy leads to unsustainable harvest levels.

Wildlife – Ungulate Winter Range

Ungulate winter ranges (UWR) in the Arrow TSA are predominantly located at low elevations (below 1100 metres) adjacent to large lakes and valley bottoms; and are necessary to meet winter habitat requirements for deer, elk and moose in areas of significant snow accumulation.

The base case scenario used the provisions of the KBLUP-IS for the management of ungulate winter range. Since then, UWR was established in 2006 under the *Government Action Regulation*, which sets a minimum requirement for mature seral and a maximum level of denudation.

A ‘Supplemental Ungulate Winter Range Analysis’ (January 2005) was provided by the timber supply analyst that compared the KBLUP-IS requirements to the updated mapping. The updated analysis showed that the new UWR had “a slight (5000 cubic metre) upward pressure on the timber supply relative to the base case scenario. However, the change would likely be similar for the uplift scenario and thus have no impact on the harvest flow increase attributable to the innovative forestry practice.

I further discuss the accounting of the harvest flow increase on the base case scenario below in my “Reasons for Decision”

Wildlife - Caribou

The base case scenario used the Kootenay Boundary Higher Level Plan Order (HLPO) aspatial requirements for caribou. In efforts to recover Caribou herds in the Southeast of

British Columbia, a no harvest area was established under the GAR in 2009. In general, there are very slight increases in overall habitat area for the South Selkirks and Central Selkirks populations within the Arrow TSA.

The AFLG notes in their uplift request that there is an unquantified downward impact due to the establishment of the Caribou GAR order. In 2007, the Species at Risk Coordination Office completed an analysis of incremental impacts of the GAR order compared to the HLPO. The incremental THLB impact was estimated at 4820 hectares, or 2.3% of the THLB.

I assume that this reduction in THLB will result in an equivalent 2.3% downward pressure on both the base case and uplift scenarios. As this area is not available for harvest, I also assume that the harvest flow increase associated with this area is not available to the IFPA holders. I account for this downward pressure in my “Reasons for Decision”.

Landscape Level Biodiversity

Old and mature targets are guided by aspatial requirements identified in the Kootenay Boundary Higher Level Plan Order (HLPO) as amended October 2002.

Mature seral targets and disturbance in the non-contributing land base were modelled appropriately in the uplift scenario and the base case scenario. However, old targets were not sufficiently modelled.

Old Growth Management Areas (OGMA) have been spatially identified in the Arrow TSA to meet old seral biodiversity requirements but are not legally established. The OGMAs meet 100% of old requirements in all landscape units (LU) except in low biodiversity emphasis LU where only 1/3 of the target is met. All licensees use the OGMA coverage as the strategy for landscape level biodiversity in their forest stewardship plans.

At the time of the Section 8 base case analysis, an earlier draft version of the OGMAs was used that did not capture the current OGMA mapping. District staff calculated that the coverage used in the Section 8 base case was about 38 000 fewer hectares of OGMA than the current coverage, with approximately 9500 hectares in the THLB. The chief forester considered a 5% downwards pressure due to use of the incorrect OGMA coverage.

For the IFPA AAC increase application AFLG provided a scenario that used the most recent spatially defined OGMAs. The differences between the OGMAs used in Section 8 base case and those used by AFLG show a net reduction of only 1851 ha in the THLB.

Applying the change of OGMAs to the uplift scenario results in a short-term reduction of 10 000 cubic metres per year which is a drop of 1.8% in the harvest level of the AAC increase application base and uplift scenarios This difference also suggests that given the chief forester considered up to 5 percent downward pressure due to the use of an incorrect OGMA coverage, the chief forester may have underestimated timber supply by 3.2%.

In my “Reasons for Decision” I account for a downward pressure on the harvest flow increase as the IFPA holder in the short term cannot access identified volume increases from these lands .I additionally consider the implications of the chief forester’s overestimation of the OGMA impact.

Unsalvaged Losses and Small Scale Salvage

The base case assumed an annual non-recoverable loss (NRL) of 28,720 cubic metres for 100 years and then a slightly lower annual NRL of 23 000 cubic metres in the long term due to a reduced influence of white pine blister rust.

Since the figures for unsalvaged losses were developed, there has been a significant increase in the level of bark beetle infestation; primarily mountain pine beetle but also fir engraver beetle. In the Section 8 AAC determination the Chief Forester included a downward pressure based on the underestimation of NRLs, and also encouraged licensees to refine estimates of NRL. The current Section 59.1 AAC increase application does not provide updated estimates of NRL.

District and Regional staff worked on revised estimates of unsalvaged losses that included recent fires and pest infestations. Annual losses were calculated to be 68 600 cubic metres, and district staff feel that this is more reflective of current NRLs. This includes unsalvaged losses due to Mountain Pine Beetle.

The small scale salvage program is supported by the provincial executive for the benefits the program generates to the province: economic and employment opportunities for entrepreneurs, forest health benefits, economic return to the crown and salvage of otherwise unsalvaged material. The volume salvaged under this program from the Arrow TSA is about 20 000 cubic metres (2003/04 estimate) and is not currently attributed to the AAC. Although a portion of this volume is expected to be part of the unsalvaged losses, certainly not all of it is.

District staff believe, as shown in the assessment above, that non-recoverable losses (non-endemic) are greater than modelled in the TSR 3 and IFPA AAC increase application analysis. This difference is up to 7.3% (i.e. 39 880 cubic metres) of the base case scenario harvest flow. From a modelling perspective NRL volumes are considered similarly on the base case and uplift scenarios and changes would have no impact on the observed harvest flow increase due to the innovative forestry practices. However, in the most recent Section 8 AAC determination, the Chief Forester did not consider the higher non-recoverable losses which could have influenced that that decision and potentially have impacted the forest licences base allowable annual cut.

I discuss my accounting for a downward pressure on the base level harvest flow below in my “Reasons for Decision”.

Mountain Pine Beetle

The Arrow TSA has approximately 15% mature pine by volume. Compared to other timber supply areas in the southern interior this is a relatively low.

In the 2005 chief forester's rationale, he recognized that the incidence of bark beetle infestation has increased. He noted that licensees are proposing to salvage harvest damaged pine-leading stands in order to reduce potential unsalvaged losses but that losses will occur as it is not desirable to harvest all pine, particularly in mixed species stands that support the mid-term timber supply. At the time of his decision he was not able to quantify the impact of mountain pine beetle on mature pine stands but felt that the likely identification of higher volumes (due to VRI phase 2) would offset the losses due to mountain pine beetle in the base case scenario.

Projections of mortality in the Arrow TSA with model BCMPB v9 (Walton et al. 2012) suggest that the annual green attack volume in the Arrow TSA has declined significantly since the 2007 projections.

AFLG provided a Mountain Pine Beetle scenario with the timber supply analysis. In this scenario they targeted stands that were considered severely impacted in 2010 as first priority for harvest. In this scenario, there is a mid-term impact due to an increase in non-recoverable losses caused by the infestation.

In his 2007 AAC increase determination, the RED recommended that licensees use the uplift to harvest Lodgepole Pine, thereby mitigating some of the downward pressure caused by Mountain Pine Beetle mortality. In response to this recommendation, all licensees except Tolko Industries Ltd. felt they had successfully dealt with at-risk pine stands. In Tolko's chart area, where the pine component makes up over a quarter of the area, pine has been almost half of their harvest

In November 2012, the report "Monitoring Harvest Activity Across 28 Mountain Pine Beetle Impacted Management Units" reported that Pine harvest was down to 17% in the Arrow TSA from the high of 35% pine harvest in 2008.

I believe that the losses identified in the timber supply analysis have or can be mitigated or at least not made worse by good stewardship in the short term. As such, I will not make an accounting specifically for the mountain pine beetle scenario other than the accounting discussed under non-recoverable losses.

Impact of AAC Increase on Other Licensees

District staff note that British Columbia Timber Sales (BCTS) has 28.7% of the AAC and 24.7% of the chart area in the Arrow TSA. Licensee chart areas have traditionally been well respected in the Arrow TSA, and BCTS is particularly concerned with maintaining their pricing area. BCTS have indicated to me that they do not support the uplift application.

Legislation and ministry policy results in the "protection" of areas designated for BCTS operations. Section 81.1 of the *Forest Act* states "If the minister determines that the issuance of a cutting permit or road permit would compromise government objectives as specified by regulation, the person who under this Act has discretion to issue the permit must refuse the application for the permit." Although regulation around this section is still under development, regional timber tenures staff believe the expected government objectives will have components such as:

- To promote equitable distribution of crown timber harvesting rights in terms species, grade, accessibility, harvest system between licence holders in TSA
- To preserve integrity of market pricing by ensuring BCTS areas are reserved
- To reserve land already designated by DM destined for other tenures agreements (e.g. FN agreements, WLs, CFAs)
- Objectives under *Forest and Range Practices Act* s.149/150/181

The selection of BCTS chart area in the Arrow TSA was based on attempting to achieve a balance of timber types in the Kootenay Pricing Area Unit. As such, access to BCTS areas within the Arrow TSA would compromise the balance required for the unit.

If the BCTS chart area is determined non- negotiable and thus not available for entry by IFPA licensees, any harvest flow increases attributable to this area would not be available.

Given that the above information is correct, I therefore conclude in my “Reasons for Decision” that it is reasonable to account for about a 24.7% downward pressure on the harvest flow increase in my determination.

Public Review

The Ministry of Forests, Lands and Natural Resource operations requested that the licensee publish a notice, notifying the public of the request for uplift continuance. A notice providing a 30 day review and comment period was published in one local newspaper by the Arrow Forest Licensee Group. No comments from the public were received.

First Nations Information Sharing and Consultation

The Ministry of Forests, Lands and Natural Resource Operations initiated consultation with First Nations with interest in the Arrow TSA via a letter sent Dec.23, 2011. The initial consultation period was 60 days however conversation continued with Splatsin until mid April. Ian Wiles, First Nations Relations Officer, Kootenay Boundary Region, prepared a consultation summary that I have reviewed.

The following First Nations have asserted territories that overlap all or portions of the Arrow TSA and were consulted with during this process:

Ktunaxa Nation Council
Lower Kootenay Band
Lower Similkameen Indian Band
Okanagan Indian Band
Okanagan Nation Alliance
Osoyoos Indian Band
Penticton Indian Band
Shuswap Indian Band
Splatsin First Nation
Westbank First Nation

The Sinixt, or Arrow Lakes Band, are thought to have been the primary First Nation occupying much of the Arrow TSA. They were, however, declared extinct by the Federal Government in the 1950's.

The Splatsin were the only First Nation to provide comments or concerns related to the IFPA Forestry Plan and AAC increase application. They assert that the increase to the allowable cut will impact their aboriginal interests and propose an accommodation model that provides them with 50% of the uplift volume. They interpret this as being consistent with the IFPA AAC increase decision in the Okanagan in 2006 and have indicated that licensees need to be identifying economic, employment and business opportunities that arise out of the implementation of the forestry plan. They also want to see more significant wording around cultural heritage resources in the plan and an inventory to be created.

Since the 2008 determination, a number of ethno historic reports and consultation processes have been conducted that indicate that numerous First Nations likely have aboriginal rights within the Arrow TSA. The ethno historic report indicates that Splats'in members used portions of the Arrow lakes traditionally for hunting and fishing. In previous consultation Splatsin has indicated their concern for activities in specific areas and in general around Arrow Lake. Their community is located in Enderby, outside of the TSA. There is no First Nation community within the TSA. There is little available information on the use of the Arrow TSA by First Nations other than the Sinixt. However there are competing claims over the area by bands of the Okanagan Nation Alliance, who claim affiliation with the Sinixt, Secwepemc and from the Ktunaxa Nation Council.

Splats'in currently has a Forest Consultation and Revenue Sharing Agreement (FCRSA) and have signed Forest Tenure Opportunity Agreements (FTOA's) in the Okanagan TSA and Arrow TSA. Volume for the Arrow FTOA originated from TSA undercut volume. Each of these agreements provides economic accommodation for forest and range activities throughout their territory. No other First Nation holds forest tenure within the Arrow TSA.

The AFLG has had a dialogue with the Splats'in within which Splats'in has voiced the same concerns as those directed to the province. The AFLG have responded by stating that "Any allocation decisions with respect to the Arrow IFPA uplift are ultimately at the

RED's discretion and beyond the control of the licensees.” They stated that any change to include First Nations as part of the IFPA committee structure can only be implemented if First Nations are able to agree among themselves what equitable representation looks like. They also provided some minor wording changes regarding cultural heritage resources in the Forestry Plan, and are investigating possible employment and economic opportunities with First Nations.

There are aboriginal rights and potentially title (undetermined at this time) within the Arrow TSA. The additional increase in harvest level awarded to innovative forestry practices agreement holders may impact on aboriginal interests somewhere within the timber supply area at some unknown level.

Given:

- (1) The small size of the proposed IFPA AAC increase,
- (2) the distribution of volume between licensee operating areas throughout the TSA,
- (3) the readily available information regarding First Nations’ historical and present use of the Arrow TSA and,
- (4) the distance of any First Nations Community from the TSA,

The potential impacts to aboriginal rights of an IFPA uplift to any First Nations will be low.

Additionally, all of the IFPA licensees have committed in their Forest Stewardship Plans to send information on planned road and harvest locations to First Nations on an annual basis. Therefore the bands will have further opportunity to comment on developments prior to any harvesting taking place and for accommodation measures to be provided at that time.

Furthermore as no First Nation holds a replaceable forest license in the Arrow TSA, I conclude that no volume will be provided to any First Nations from this Section 59.1 allowable annual cut increase determination. This is consistent with the January 2008 AAC increase determination in the Arrow TSA. FCRSA’s and FTOA’s with First Nations will provide economic accommodation measures, with additional opportunity for accommodations from licensees to be provided where issues arise on specific cutting permits and road permits.

Socio-Economic Assessment

No information regarding the economic profile of the area has been collected since the Section 8 timber supply review. At that time the public sector was that most predominant employer, with forestry being second.

Among the basic sectors, there is a great variation in the average income earned. In this case, the forest sector and the mining and petroleum have much higher incomes than the other basic sectors.

A diversity index was defined to measure the relative diversity of local economies. The Arrow and Boundary TSAs ranked very highly, indicating a relative diverse economy.

The notion is that an economy that is not diverse and highly dependent on the forest industry will be particularly vulnerable to changes in the forest sector. The analysis determined an index rating of low to moderate vulnerability for the Arrow and Boundary TSAs.

The Arrow TSA has had an AAC of 550 000 cubic meters per year and additional 34 000 cubic metres under Section 59.1 (up to August 2011). However, the TSA is currently in an undercut position due to the shutdown of Springer Creek Forest Products. An increase or decrease in the allowable annual cut that is harvested would have impacts on both the local economy of the Arrow TSA and provincial revenues.

The current AAC in the Arrow TSA if fully harvested would support about \$31 million of direct forest sector employment of which about \$21 million would be within the TSA and generate about \$19 million in revenue for the province.

Share Agreement

IFPA holders signed a share agreement in 2007 related to the Arrow TSA IFPA uplift request. IFPA holders represent all of the replaceable forest licences in the TSA with an AAC of 346 882 cubic metres about 63 percent of total apportionment of the Arrow TSA. The share agreement reflects the relative commitment of the existing AAC to the five IFPA holder licensees as follows: ATCO Wood Products Ltd (43.7 percent), International Forest Products Ltd. (28.8 percent), Tolko Industries Ltd. (13.7 percent), Kalesnikoff Lumber Co. Ltd. (10.0 percent), and Stella-Jones Canada Inc. (3.7 percent).

I see no reason not to respect this proposal, as such my determination, which requires that I award an increase only the IFPA holders, will reflect his share agreement.

Reasons for Decision

In reaching my decision on a request for an increase in allowable annual cut to the forest licences held by the IFPA holders, I have considered all of the factors presented to me, and I have reasoned as follows.

An increase in allowable annual cut is based upon the increment in short-term harvest flow attributable to the innovative forestry practices and activities. These innovative forestry practices and activities are identified in the approved forestry plan and have been or will be carried out by the IFPA holders in accordance with the forestry plan.

Section 59.1 of the *Forest Act* requires that I justify an increase in allowable annual cut based on timber supply analysis methodology approved by the chief forester. The Chief Forester, in his timber supply analysis considerations for IFPAs, identifies the types of information that should be included. This includes information around land base, inventory, growth and yield, and management objectives. This methodology also recognizes the need to consider operational feasibility, harvest flow patterns, consistency with legislation and policy, and the reflection of current and reasonably foreseeable practices.

In my decision, I also recognize the Chief Forester's Section 8 allowable annual cut determination as this decision provides the foundation of the apportionment and disposition of licences in the Arrow TSA. Before I consider an allowable annual cut increase, I believe that it is responsible to ensure that the information provided confirms that the Section 8 AAC level is supported. As such, I need to be mindful of (1) how the chief forester considered the available information and (2) information not available at the time of the chief forester's determination.

In the most recent Section 8 determination, the Chief Forester was aware that the IFPA holders were conducting a VRI Phase 2 and NVAF project and that based on an audit in the TSA it was likely the VRI Phase 2 and NVAF would identify increased volumes. In his rationale the Chief Forester used a 10 percent increase in natural stand volume to support his AAC decision. This 10 percent consideration can be viewed as supporting the base allowable annual cut of the IFPA holders' licences. As such; this volume should not be double counted as part of any AAC increase on the licences. Therefore I will view that only 35 000 cubic metres per year of the short term harvest flow increase attributable to the innovative forestry practices is available to a *Section 59.1* AAC increase.

In reviewing other factors with respect to the Section 8 AAC determination that the Chief Forester considered and those that he did not, I found a more or less balance of upward and downward pressures related to the base case scenario harvest flow. Therefore, except for the volume identified above for the Chief Forester's accounting of the forest inventory, I found the base case scenario to be a base that demonstrates the current Section 8 AAC can be supported.

Since the base case scenario was developed, some changes have occurred resulting in land base that is not available for harvest by the IFPA holders and as such the IFPA holders would be unable to access the identified increase in timber volumes due to the innovative forestry practices. I consider that the IFPA holder cannot be credited for increased volumes from community forests and woodlots, caribou no-harvest-zones, the

old growth management area not modelled, and small isolated land base that are unlikely to be harvested.

I also find that the chart area of British Columbia Timber Sales would not be accessible to the IFPA holders and thus should not contribute to an allowable annual cut increase.

I am also mindful that some of the above areas that the IFPA holders cannot access will overlap and that I must make considerations for such.

I need to be aware of harvest flow projections beyond the short-term. In particular in the mid-term there are concerns that increase non-recoverable losses due to mortality from the Mountain pine beetle will decrease the mid-term timber supply. While this issue likely has minimal effect on timber supply availability in the short-term, I believe that it is my responsibility where possible to mitigate such losses, if possible. As such, in my decision I have considered a small downward reduction on an AAC increase is necessary to help mitigate such future losses.

First Nations have made requests with respect to an economic accommodation for an increase in allowable annual cut. As I noted above, I can in this decision only award an allowable annual cut increase to the holders of an Innovative Forestry Practices Agreement. I also believe that for this decision First Nations are sufficiently accommodated under existing agreements and that there are other mechanisms for accommodation related to specific operational decisions that arise from an increased harvest level.

In making allowable annual cut increase determinations, I am mindful of my obligation as steward of the forest land of British Columbia, of the mandate of the Ministry as set out in Section 4 of the *Ministry of Forests Act*, and of my responsibilities under the *Forest Practices Code Act of BC* and the *Forest and Range Practices Act*.

In summary, I am satisfied that the information provided with the application is sufficient upon which for me to base a decision about an allowable annual cut increase on the IFPA holder's licences.

Determination and Conditions

I have reviewed and considered all the factors and the associated uncertainties described in this document.

First, I approve the Forestry Plan as submitted September 29, 2011 with the recognition of the initial innovative forestry practices that have been completed and that the related background information contained within the June 3, 1999 forestry plan and appendices are still valid components of the forestry plan. My approval of the Forestry Plan expires December 31, 2015.

Second, I determine that innovative forestry practices or activities under the IFPAs provide 22 000 cubic metres per year from within the Arrow TSA and award such to the IFPA holders.

The 22 000 cubic metres awarded under Section 59.1 will be allocated as follows:

- A20191 – Tolko Industries Ltd. by 3 018 cubic metres per year
- A20192 – International Forest Products Ltd by 6 343 cubic metres per year
- A20193 – ATCO Wood Products Ltd. by 9 616 cubic metres per year
- A20194 – Kalesnikoff Lumber Co. Ltd. by 2 201 cubic metres per year
- A20196 – Stella-Jones Canada Inc. by 822 cubic metres per year

The award on each licence is subject to the condition below:

- Submit an annual report by May 31th of each year that summarizes the activities completed by the IFPA holder in the past year and the expected activities in the upcoming year.

This determination is effective January 1, 2012 and will remain in effect until December 31, 2015, the date at which the innovative forestry practices agreements expire. I note that I am prepared to revisit the allowable annual cut awarded if I find information or assumptions upon which this decision is based are not justified or that conditions of this decision have not been met.



Tony Wideski, R.P.F.
Regional Executive Director
Kootenay Boundary Region

June 18, 2013

Appendix 1: Section 59.1 of Forest Act

Innovative forestry practices 59.1

- (1) For the purpose of improving the productivity of the forestry resource, the minister, at his or her discretion, may enter into an agreement with a person referred to in subsection (2) to allow that person to carry out, subject to subsection (5) and the *Forest and Range Practices Act*, one or more of the innovative forestry practices and other activities that are set out in a regulation made under subsection (4).
- (2) For the purposes of subsection (1), the minister may enter into an agreement with a person who (a) is the holder of a forest licence or other agreement that is entered into under section 12 and specified in a regulation made under subsection (4) of this section, and (b) presents a written proposal for an agreement to the minister.
- (3) An agreement under subsection (1) (a) must be for a term not exceeding 15 years, and (b) may include terms and conditions that (i) the minister considers are necessary to effectively carry out the purpose of the agreement and further the social and economic objectives of the government, and (ii) are consistent with this Act and the regulations and the *Forest and Range Practices Act*, and the regulations and standards made under that Act.
- (4) The Lieutenant Governor in Council may make regulations specifying (a) the innovative forestry practices and other activities that may be the subject of an agreement referred to in subsection (1), and (b) the agreements entered into under section 12, the holders of which may enter into an agreement with the minister under subsection (1) of this section.
- (5) A person may only carry out an innovative forestry practice or other activity referred to in subsection (1) if the person (a) has prepared and obtained the regional executive director's approval of a Forestry Plan that meets the requirements of subsection (6), and (b) is carrying out the practice or activity in accordance with the plan.
- (6) A Forestry Plan (a) must contain a description of the management area where the innovative forestry practices or other activities will be carried out, (b) must specify the particulars of the innovative forestry practices or other activities, (c) must contain a description of how the innovative forestry practices or other activities will be carried out, (d) must contain a schedule of when the innovative forestry practices or other activities will be carried out, (e) must specify how the innovative forestry practices or other activities will contribute to improved productivity of the forestry resource, (f) must specify how the innovative forestry practices or other activities will justify an increase in the allowable annual cut of the participant's licence or agreement referred to in subsection (2) (a), and (g) may include other terms and conditions that (i) the regional executive director believes are necessary to effectively carry out the agreement referred to in subsection (1), and (ii) are consistent with this Act and the regulations and the *Forest and Range Practices Act*, and the regulations and standards made under that Act.
- (7) After approving a person's Forestry Plan, the regional executive director may increase the allowable annual cut authorized in the person's licence or agreement referred to in subsection (2) (a) by an amount that is justified according to timber supply analysis methodology approved by the chief forester or the chief forester's designate.
- (8) When the regional executive director increases an allowable annual cut under subsection (7), the regional executive director may limit the increase to a period of time, area of land and type of timber, and may make the increase subject to conditions.
- (9) If an assessment of (a) the innovative forestry practices or other activities being carried out under the Forestry Plan, or (b) information that was not available at the time the regional executive director increased the allowable annual cut under subsection (7) indicates that all or part of the allowable annual cut increase was not justified, the regional executive director may reduce the allowable annual cut of the licence or agreement referred to in subsection (2) (a) by an amount not exceeding the increase granted under subsection (7).

- (10) If, with respect to an innovative forestry practice or other activity, a person is not complying with (a) the agreement referred to in subsection (1), (b) the Forestry Plan approved under subsection (5), (c) any limitation or conditions imposed under subsection (8), or (d) this Act and the regulations made under this Act, or the *Forest and Range Practices Act* and the regulations or standards made under that Act, the regional executive director may do one or both of the following: (e) suspend or cancel the agreement referred to in subsection (1) and sections 76 and 77 apply with respect to that suspension or cancellation; (f) reduce the allowable annual cut of the person's licence or agreement referred to in subsection (2) (a) by an amount the regional executive director determines is attributable to the default.
- (11) A reduction under subsection (9) or (10) may be apportioned over a period of up to 5 years.
- (12) If the forest licence, or other agreement referred to in subsection (2) (a), is suspended, the agreement under subsection (1) is suspended.
- (13) If the forest licence, or other agreement referred to in subsection (2) (a), is cancelled or surrendered, the agreement under subsection (1) is cancelled.
- (14) If the agreement referred to in subsection (1) is suspended or cancelled, the Forestry Plan is suspended or cancelled, as the case may be.

Appendix 2: Innovative Forestry Practices Regulation

B.C. Reg. 197/97, O.C. 0694/97 - Deposited June 18, 1997
Consolidated to July 21, 2011

Definitions

1 In this regulation:

"Act" means the *Forest Act*;

"forestry plan" means a forestry plan required to be submitted for approval under section 59.1 (5) of the Act;

"forest practice" has the same meaning as in the *Forest Practices Code of British Columbia Act*;

"free-growing stand" has the same meaning as in the *Forest Practices Code of British Columbia Act*;

"holder" means a person that presents a written proposal for an agreement under section 59.1 (2) (b) of the Act;

"permanent access structure" has the same meaning as in the *Forest Practices Code of British Columbia Act*;

"standard practices" means the forest practices routinely applied by licensees in the timber supply area when the forestry plan is submitted or at any other time determined by the minister;

"stocking requirements" has the same meaning as in section 1 (1) of the Operational and Site Planning Regulation, B.C. Reg. 107/98.

[am. B.C. Regs. 292/2003, Sch. E, s. 1; 133/2011, Sch. s. 16.]

Authorized innovative forestry practices and activities

2 The innovative forestry practices and other activities that may be the subject of an agreement under section 59.1 (1) of the Act are the following:

(a) the implementation of harvesting methods or silvicultural systems that may

(i) increase the total amount of timber available to harvest in the timber supply area over the amount available under standard practices, or

(ii) reduce the loss of productivity associated with permanent access structures from the loss of productivity under standard practices for similar terrain and timber types in the timber supply area;

(b) activities that result in the establishment of free-growing stands on

(i) previously unforested areas,

(ii) areas that are below stocking requirements and are not part of the holder's free-growing responsibilities under sections 69.1 (3) and 70 (3) of the *Forest Practices Code of British Columbia Act*, or

(iii) areas that

(A) have stands of timber with repressed growth or that contain brush or species that are not commercially valuable, and

- (B) are not part of the holder's free-growing responsibilities under sections 69.1 (3) and 70 (3) of the *Forest Practices Code of British Columbia Act*;
- (c) silviculture treatments on free-growing stands;
- (d) silviculture treatments on sites that are not free growing in order to produce stands that exceed current growth performance or standards achieved using standard practices for the timber supply area;
- (e) the collection and analysis of new data, in accordance with the specifications of the chief forester, to provide a more accurate representation of the forest composition and its expected rate of growth compared to the rate existing when the forest plan is submitted or at any other time determined by the minister;
- (f) activities that will enhance and protect other resource values, including, but not limited to, water, fisheries, wildlife, biological diversity, soil productivity and stability, forage production, grazing and recreation values.

[am. B.C. Regs. 292/2003, Sch. E, s. 2; 133/2011, Sch. s. 17.]

Authorized forms of agreement

3 The holders of the following agreements under section 12 of the Act may enter into an agreement under section 59.1 of the Act:

- (a) replaceable forest licences;
- (b) replaceable timber sale licences with an allowable annual cut greater than 10 000 cubic metres.

Maximum term of agreements

4 The maximum term of an agreement under section 59.1 (1) of the Act is 20 years.

[en. B.C. Reg. 310/2010, s. (b).]

[Provisions relevant to the enactment of this regulation: *Forest Act*, R.S.B.C. 1996, c. 157, sections 59.1 and 151]

Appendix 3: Memorandum from chief forester on timber supply methodology



Ministry of
Forests

Chief Forester

MEMORANDUM

File: 19500-01/IFPA

April 6, 2001

To: Regional Managers

From: Larry Pedersen
Chief Forester

Re: **Timber Supply Analysis Methodology Related to Innovative Forest Practices Agreements (IFPAs)**

I am certain you are aware that the *Forest Act*, section 59.1, gives regional managers the responsibility for determining if increases in allowable annual cuts (AACs) for IFPA holders are justified. The *Act* requires regional managers to make their judgements according to a timber supply analysis methodology approved by the Chief Forester or the Chief Forester's designate. Attached to this memorandum is a timber supply analysis methodology to fulfill my responsibility under section 59.1 of the *Act*.



The methodology covers general analytical issues related to information needs, analysis outputs, links between AACs for IFPAs and TSAs, harvest flow, AAC increases, and legislation and policy. The method does not dictate the types of innovative practices that should or may be considered appropriate for approval as part of forestry plans, or for justifying AAC increases. Approval of forestry plans is clearly the regional managers' responsibility under the *Act*. Further, I believe that information and practices must be evaluated on their own merits within specific contexts; hence it would not be reasonable for me to prescribe evaluative criteria.

In the end, regional managers must make their own determinations based on analysis that provides insight on the full range of relevant factors, including the important risks and uncertainties. The analysis methodology is designed to assist in this undertaking.

Timber supply analysis methodology – IFPAs
Page 2

The methodology should be included as an appendix to the Forestry Plan Outline to ensure the approach is clear to all government staff and external stakeholders. Please contact Chris Fletcher of Timber Supply Branch (250-356-5959, Chris.Fletcher@gems8.gov.bc.ca) with comments or concerns.



Larry Pedersen
Chief Forester

Attachment: Timber Supply Analysis Considerations for Innovative Practices Agreements

cc: Gary Townsend, Director, Timber Supply Branch
Ralph Archibald, Director, Forest Practices Branch
Henry Benskin, Director, Research Branch
Dave Gilbert, Director, Resources Inventory Branch
Dale Draper, Director, Tree Improvement Branch
Jim Langridge, Director, Resource Tenures and Engineering Branch
Drew Brazier, Resource Tenures and Engineering Branch

Appendix 4: Timber Supply Analysis Methodology Related to Innovative Forestry Practices Agreements (IFPAs) provided by the Chief Forester.

Section 59.1 (7) of the *Forest Act* allows regional executive directors, after approving an IFPA Forestry Plan, to increase the allowable annual cut of the holder's forest licence by an amount that is justified according to a timber supply analysis method approved by the chief forester or the chief forester's designate. The following discussion outlines the timber supply analysis method and allowable annual cut decision principles used by the chief forester.

The focus is on components and principles of timber supply analyses that are crucial in gaining an understanding of factors that determine timber supply in an area. Because of the complexities involved in determining harvest levels, it is not possible to develop precise procedures or simple calculations for timber supply analysis. The process can be guided by general principles—which are outlined below—however, the detailed aspects must be developed using case specific professional judgement. In this light, the following ideas are provided as guidance, not as firm procedural requirements that must be followed in all cases. While the general ideas apply in almost all cases, each case must be viewed as unique: some cases may require additional analysis to that outlined, while others may be assessed satisfactorily with less detail than suggested here.

If a timber supply analysis incorporates the types of information noted below, and facilitates evaluation of the considerations discussed, it will have followed a timber supply analysis method supported by the chief forester.

The chief forester's task under the *Forest Act* is to provide an analysis method, not to evaluate, or provide a method for evaluating information quality. Hence, the discussion here does not address information quality but focuses on an analytical method. Nevertheless, the results of any analysis depend heavily on the quality of the information used in the analysis; that is, information about the forest land base, growth and yield, and management objectives. Evaluation of information quality must be done on a case-specific basis, which regional executive directors, in their evaluation of IFPA analyses, are best positioned to do.

Analysis should consist of clear descriptions of issues, information sources, assumptions, and any relevant data manipulations or adjustments related to the following three categories:

Land base:

- A tabular description of the categories of land and forest that are excluded from the timber harvesting land base, and the area excluded in each category. Such tabular descriptions are included in all timber supply analysis reports published for TSAs as part of the Timber Supply Review.
- A detailed description of the criteria employed in deriving the area included in the above table. This description should follow a format similar to the Information Package for Tree Farm Licence analyses.

- A description of the composition of the timber harvesting land base and the total forested land base in terms of species, site quality, stand age, and any other features relevant in the area.

Growth and yield:

- A description of the models and methods used in generating timber yield tables for existing and regenerated stands.
- The yield tables used for each species and site quality group and silvicultural regime.
- Detailed descriptions of methods and concepts underlying site productivity estimates and yield tables that reflect any planned innovative management.
- Notice of acceptance by appropriate BC Ministry of Forests staff of site productivity or yield estimates or adjustments corresponding to both baseline and innovative practices, and of any sampling or study methods related to deriving the estimates.
- MFR, Regional Growth and Yield Foresters will coordinate the growth and yield review process.

Management objectives:

- A description of the various management objectives that apply to the area and the methods used to represent actions used to achieve the objectives (e.g., silvicultural regimes, utilization levels, seral forest cover requirements, extended “rotations,” alternative harvesting systems). The description should specify the component of the land base to which the objective applies; for example, timber harvesting land base, or Crown forested area. The template for Information Packages for Tree Farm Licence analyses provides a framework for organizing relevant information.

Analysis is facilitated if communication between relevant ministry staff and the agreement holders regarding land base, growth and yield, and management inputs occurs as early as possible in the analysis process.

Other considerations include:

Model review and benchmarking. There are no specific requirements or limitations on which analysis models may be used. However, interpretation of results and confidence that timber supply effects can be attributed to innovative practices rather than model differences requires a detailed understanding of assumptions made in the model about relevant processes and features. The best method of gaining this understanding is to benchmark the model with FSSIM, or other models used and understood by Timber Supply Branch staff. This is not to imply that FSSIM is a better model, or produces more accurate results than other models. It is simply the case that Ministry of Forests staff understands how FSSIM works, and can therefore use it as a basis for understanding how other models work. If the model to be used has not been reviewed and benchmarked by Ministry of Forests staff, the agreement holder should develop a review process in cooperation with Timber Supply Branch or a regional timber supply analyst. If the model being benchmarked produces different results from FSSIM (or other models used and understood by Timber Supply Branch staff), the agreement holder or its representative should be responsible for explaining the differences in detail in a technical document.

Even with a benchmarked model, the potential to increase harvest levels should be evaluated using the same model for both current and innovative practices. For example, a timber supply forecast corresponding to an innovative management regime and generated with a model other than FSSIM should not be compared directly to a forecast derived using FSSIM and the current management regime. Using results generated with the same model will help ensure any timber supply increase is based on management not model differences.

Results and reporting. The analysis report and related appendices should include sufficient output information to allow understanding of the main factors determining timber supply, and if applicable, reasons behind timber supply changes due to proposed innovative practices. Management, land base and growth and yield assumptions are to be documented in an Information Package. The timber supply analysis should demonstrate how these assumptions affect timber supply. The outputs should allow for examination of all relevant forest management objectives; for example, areas in seral stages by landscape unit, or area achieving visually effective green-up in visual management zones. Outputs related to timber inventory levels, areas and average volumes harvested, average age of harvested stands, and age class distributions over time all assist in understanding timber supply dynamics and evaluating the feasibility and realism of analysis results.

Sensitivity analysis. The analysis report must include results of sensitivity analyses that examine a reasonable range of uncertainty around management, land base and growth and yield assumptions and proposed innovative practices. The implications of changes in available funding to undertake planned innovative practice may be an important consideration for sensitivity analysis.

Operational feasibility. The analysis should examine any issues that may affect the operational feasibility of harvesting at the levels indicated. The most common issue involves the ability to locate harvest opportunities spatially.

Interactions between IFPA area and the TSA. IFPA timber supply analysis should demonstrate that any harvest level increases related to IFPAs will not disadvantage timber supply at the TSA level, or timber supply available to other operators in the TSA. An IFPA area may not be representative of the forest and management conditions for the TSA, and hence analysis results for the IFPA area should not be extrapolated and assumed to apply to the whole TSA.

Administration of IFPAs is the purview of the regional executive director, and it is the regional executive director's prerogative to require or request any analysis that s/he believes will assist in clarifying matters regarding IFPA AACs. It may be appropriate to investigate, using timber supply analysis, the advantages and disadvantages of different approaches to administering timber supply in the IFPA in the context of the TSA. For example, benefits may be gained by administering timber supply flexibly at the TSA level (e.g., allowing for harvesting of an IFPA increase from throughout the TSA not only the IFPA area) rather than combining timber supplies that have been assessed separately for spatial sub-units of the TSA. Ultimately, the regional executive director will decide on the administrative approach, and the analysis must be consistent with that approach.

The intent here is to highlight that analysis must show that timber supply benefits for IFPAs will not come at the cost of supply at the TSA level or other operators in the area.

Harvest flow. Timber supply forecasts employing assumptions/estimates of both current and proposed innovative practices must follow reasonable flow patterns over time. In general, a reasonable flow pattern provides for a controlled and gradual transition from short-term to medium- and long-term harvests, and avoids large and abrupt disruptions in supply. Considerations include: rate of harvest level decline if any is necessary; the degree to which mid-term timber supply may appropriately drop below the long-term sustainable harvest level; and the timing of increase to the long-term sustainable timber supply if it is higher than mid-term levels.

A difference between mid-term and long-term levels may be justified because mid-term supply depends more on the existing stock of timber and the timing of availability of regenerated stands, while long-term timber supply is based on timber growth which is affected by site productivity and forest management practices. Maintaining mid-term levels above or equal to the long-term level could in some circumstances delay the achievement of, or lead to failure to achieve the maximum long-term level, or cause timber supply disruptions, because of limited supply of existing timber. Likewise, a decline in timber supply from a higher short-term supply to a lower mid-term may be appropriate if it can be shown that the associated harvests do not jeopardize or cause disruptions in long-term productivity.

The analysis should include different harvest flows that examine each of these considerations. A "base case" harvest flow for current practices must be chosen from the range of possibilities. The choice should be explained. In most cases this explanation can be brief, and consist primarily of reference to alternative harvest flow patterns. The IFPA base case harvest flow should reflect that used in the Timber Supply Review base case, if relevant. This will ensure that any change in short-term timber supply is due to changes in management, not harvest flow.

The analysis report should describe the criteria used to determine:

- the long-term harvest level and growing stock (criteria for sustainability);
- the harvest flow (e.g., maintain current harvest level for as long as possible, maximize volume harvested over a specified time frame, control the rate of decline);
- the minimum harvest level allowed in the medium term.

Allowable cut increases. Harvest forecasts for many management units in B.C. show declining timber supply over a period of decades. The general approach in cases of declining timber supply is that short-term allowable cuts are not usually increased unless there is a sound demonstrated forest management reason. This approach ensures that allowable cuts are not increased in the short term only to force reductions in the near future. There may be sound forest management reasons, such as existence of high risk of loss of stands to fire, insects or disease due to current or developing stand attributes (e.g., age or diameter distribution favourable to beetle attack, etc.).

An AAC increase in the short term should not decrease future timber supply below the

levels forecast without the increase, unless there is a documented and compelling reason to do so.

The general approach described above for TSA and TFL AAC determinations with respect to potential increases leads to some issues for IFPAs. One of the explicit aims of the IFPA initiative is to allow AAC increases for IFPA holders. However, one stipulation of an increase is that other license holders will not be negatively affected by any AAC increases for the IFPA. In this context, important considerations in designing and interpreting an IFPA timber supply analysis would include:

- what are the forest management reasons that justify an AAC increase?
- what effects would an increase have on future timber supply?
- would a boost in AAC increase the sensitivity of future timber supply to uncertainties?
- if the forecast is for a temporary short-term increase (that is, timber supply is forecast to decline from the higher level) what actions will be taken to mitigate or avoid future socio-economic impacts? In other words: in the absence of a forest management objective for increasing the AAC, how will a temporary increase assist in strengthening the long-term role of timber harvesting and processing in the social and economic fabric of the area (capacity-building, diversification, etc.)?

Consistency with legislation and policy. The land base, growth and yield and management regime modeled in the analysis should be consistent with current legislation and policy. While the need for consistency with laws and policy is perhaps self-evident, it must be acknowledged that one of the goals of IFPAs is to move management in new directions. Therefore, it is imperative that modeling of proposed innovative management does not imply conflicts with legislation and policy. This analytical consideration differs from the approval of innovative management that is the regional executive director's responsibility as part of Forestry Plan approval. The intent here is to highlight the need to evaluate analysis inputs and results to ensure that they do not create or imply conflicts. If a timber supply forecast is based on conflicts with designations or objectives that are the responsibility of other statutory decision makers under existing laws or policies, that forecast cannot reasonably be accepted as a basis for harvest level determination.

Relationship between chief forester (TSA) and regional executive director (IFPA) determinations. The concern has been raised that AAC determinations for TSAs under Section 8 of the *Forest Act* may conflict in some way with AAC determinations for IFPAs. Communication between the chief forester and regional executive director will be necessary to avoid discrepancies or conflicts regarding AAC determinations. It is not possible to generalize about the relationship between TSA AAC determinations and related to IFPAs given the diversity of timber supply conditions across the province.

A guiding principle for TSA and TFL AACs is that the determination should reflect current or reasonably foreseeable practices. Use of the preceding method and considerations should ensure that practices approved under IFPAs will constitute current

or reasonably foreseeable management, and will be considered as such in TSA AAC determinations.

Documentation of decisions. Documentation of reasons for decision is useful to ensure the basis for the decision is clear and understandable. Further, both the regional executive director and the chief forester have AAC determination responsibilities under the *Forest Act*. Reasonably detailed decision documentation, referring to the technical considerations discussed in this methods document, would help ensure consistency between regional executive director and chief forester determinations, particularly when the time period between the decisions is long.