BRITISH COLUMBIA

MINISTRY OF FORESTS, LANDS AND NATURAL RESOURCE OPERATIONS

Tree Farm Licence 48

held by

Canadian Forest Products Ltd. (Canfor)

Rationale for Allowable Annual Cut (AAC) Determination

Effective October 15, 2015

Diane Nicholls, RPF

Chief Forester

Table of Contents

Objective of this document....1
Statutory framework....1
Description of the TFL....1
History of the AAC....2
New AAC determination....2
Information sources used in the AAC determination....2
Role and limitations of the technical information used....4
Guiding principles for AAC determinations....5
The role of the base case....7
Timber supply analysis....8
Consideration of factors as required by Section 8 (8) of the *Forest Act*....10
Factors requiring additional explanatory consideration....11
Factors considered under Section 8(8)(a)(i)....11
- Mountain Pine Beetle epidemic....11
- forest inventory....12
- inoperable....14
- cultural heritage resource reductions....14
- recreation....15
- low productivity sites identified for immature stands....15
- mature stand problem forest types....15
- regeneration delay....16
- not sufficiently restocked....16
- silvicultural systems....17
- genetic improvement....17
Factors considered under Section 8(8) (a)(v)....18
- ungulate winter range....18
- wildlife habitat areas....18
- watershed objectives....19
- disturbing the non-contributing land base....20
- Factors considered under Section 8(8) (a)(vi)....20
- pulpwood agreements, deciduous harvest and partitioned component of harvest....20
- harvest performance in balsam stands....21
- cumulative effects....22
- First Nations considerations....24
Factors considered under Section 8(8) (b)....28
- alternative rates of harvest....28
Factors considered under Section 8(8) (d)....29
- Minister's letter....29
Factors considered under Section 8(8) (e)....30
- fires....30
Reasons for Decision....30
Determination....32
Implementation....32
Appendix 1: Section 8 of the *Forest Act*....34
Appendix 2: Section 4 of the *Ministry of Forests and Range Act*....37
Appendix 3: Minister's letter of July 4, 2006....38
Appendix 4: Minister's letter of October 27, 2010....40

List of Tables

Table 1. List of accepted factors 10

Objective of this document

This document provides an accounting of the factors I have considered, and the rationale I have employed in making my determination, under Section 8 of the *Forest Act*, of the allowable annual cut (AAC) for Tree Farm Licence 48 (TFL 48). This document also identifies where new or better information is needed for incorporation in future determinations.

Statutory framework

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

Description of the TFL

TFL 48, also known as the Chetwynd TFL, is held by Canadian Forest Products Limited (Canfor or 'the licensee'). It is made up of five distinct supply blocks in the southwest portion of the Peace Natural Resource District. The district office is based in Dawson Creek. It is one of two districts in the Northeast Region of the Ministry of Forests, Lands and Natural Resource Operations (FLNR).

The majority of the TFL borders the Dawson Creek Timber Supply Area (TSA), but portions also share boundaries with the Mackenzie, Fort St. John and Prince George TSAs. Approximately 67 percent of the TFL overlaps with the operating area of Pulpwood Agreement (PA) 13, held by Chetwynd Mechanical Pulp, a Paper Excellence Company.

The eastern part of the TFL is located in the Alberta Plateau, characterized by flat or gently rolling terrain, while the southern and western parts are within the Rocky Mountains. There are four biogeoclimatic zones found in the TFL: Boreal White and Black Spruce (BWBS), Sub-Boreal Spruce (SBS), Engelmann Spruce-Subalpine Fir (ESSF) and Alpine Tundra (AT).

There is considerable variation in tree species and productivity. Principal commercial tree species are white spruce, lodgepole pine, subalpine fir, trembling aspen and cottonwood. A large proportion of these species exist in mixed-wood stands of two or more different species. Larch, white birch and black spruce also occur in the TFL but are not commercially valuable at present.

TFL 48 is within the geographical area covered by Treaty 8 and overlaps the traditional territories of the West Moberly First Nations, Saulteau First Nations, Halfway River First Nation, Blueberry River First Nations and the McLeod Lake Indian Band who are signatories to Treaty 8. They each have traditional territories that overlap with portions of TFL 48. The West Moberly First Nations and Saulteau First Nations have reserves that are directly adjacent to the TFL.

Communities in the area include Chetwynd, Tumbler Ridge, Hudson's Hope, West Moberly, Moberly Lake and Saulteau. Chetwynd is where the licensee's sawmill is located and is the most economically dependent upon harvesting operations in TFL 48. Other economic activities in the area include oil and gas exploration and development, mining, hydro-electric power generation, agriculture, trapping, outdoor recreation and public services.

The current timber harvesting land base (THLB) assumed in the base case of the TFL 48 analysis is 359 717 hectares, or 55.9 percent of the total TFL area. A further 32 percent of the TFL is covered in productive forest that is not considered to be in the timber harvesting land base, and the remainder is non-productive or non-forested area.

History of the AAC

The most recent AAC was determined in May 2007 at 900 000 cubic metres. This included a 100 000 cubic metre attribution under Section 8(5)(a) of the *Forest Act* to deciduous and coniferous trees within deciduous-leading stands.

New AAC determination

Effective October 15, 2015, the new AAC for TFL 48 is 1 550 000 cubic metres for five years from the date of this determination. After that the AAC will be 871 000 cubic metres. Within this AAC, I specify under Section 8(5)(a) of the *Forest Act* that 100 000 cubic metres are attributable to deciduous and coniferous trees in deciduous-leading stands. This AAC will remain in effect until a new AAC is determined, which must take place within 10 years of this determination.

Information sources used in the AAC determination

The information sources considered in determining this AAC for TFL 48 include the following:

- TFL 48 Timber Supply Analysis Report. Canfor. Submitted August 8, 2006 and accepted by the BCFS on August 31, 2006 (referred to as the '2006 analysis' in this document);
- TFL 48 Timber Supply Analysis Information Package. Canfor. Submitted March 17, 2006 and accepted by the BCFS on April 25, 2006;
- Tree Farm Licence 48, Vegetation Resource Inventory Statistical Adjustment. Prepared by J. S. Thrower and Associates for Canfor, March 16, 2005;
- Natural Stand Yields, submitted September, 2013 and accepted by Forest Analysis and Inventory Branch (FAIB) staff April 8, 2014;
- Managed Stand Yields, submitted February 12, 2014 and accepted by FAIB staff March 20, 2014;
- Tree Farm Licence # 48, Timber Supply Analysis Data Package submitted September, 2013, updated February 2014, accepted by FAIB staff April 1, 2014;
- Tree Farm Licence #48, Management Plan # 5, Expedited Timber Supply Analysis, submitted February, 2014, re-submitted June, 2014, re-submitted December 2014, accepted by FAIB staff April 1, 2015;
- Management Plan #5, Tree Farm Licence 48, submitted June 11, 2014, re-submitted January 21, 2015. Chief Forester approved October 15, 2015;
- Dawson Creek Land and Resource Management Plan, BC Land Use Coordination Office, 1999;
- *Forest and Range Practices Act*, Regulations and Amendments;
- *Oil and Gas Activities Act*, Regulations and Amendments;
- *Forest Practices Code of British Columbia Act* and amendments and regulations and guidebooks;
- *Interpretation Act*;
- *Land Act*;
- *Heritage Conservation Act*;
- Order Establishing Provincial Non-Spatial Old Growth Objectives, June 30, 2004;
- 2010 Visual Landscape Inventory Update, Peace Forest District, Dawson Creek TSA & TFL 48 – Moberly Lake and Highway 97, Section 7(1) of the *Government Actions Regulation*, March 22, 2010;
- Establishment of Scenic Areas and Visual Quality Objectives within the Peace District, Section 7(1) of the *Government Actions Regulation*, July 12, 2012;

- Order for the Establishment of Visual Quality Objectives for the Peace Forest District, Section 7(2) of the *Government Actions Regulation*, December 16, 2012;
- Summary of dead potential volume estimates for management units within the Northern and Southern Interior Forest Regions, BC Ministry of Forests and Range, Forest Analysis and Inventory Branch, 2006;
- TFL 48 Predictive Ecosystem Mapping (PEM) Year 2008 Accuracy Assessment, Bio-Geo Dynamics Ltd., 2009;
- Stream Classification Tool, TFL 48. Prepared for Canfor by Hatfield Consultants and Ecometrics Research, 2000;
- *Species at Risk Act* (S.C 2002, c29);
- Identified Wildlife Management Strategy Version 2004. Ministry of Environment. May 2004;
- Committee on the Status of Endangered Wildlife in Canada, Candidate Wildlife Species, September 5, 2014;
- Action Plan for the Klinse-Za Herd of Woodland Caribou (Rangifer tarandus caribou) in Canada [Draft]. Species at Risk Act Action Plan Series. West Moberly First Nations, Moberly Lake, British Columbia, 2013;
- Implementation Plan for the Ongoing Management of South Peace Northern Caribou (Rangifer tarandus caribou pop. 15) in British Columbia', March 2013;
- Ungulate Winter Range (UWR) Order # U-9-002 for Caribou, Bighorn Sheep and Mountain Goat, October 22, 2006;
- Ungulate Winter Range Order#U-9-004 for Northern Caribou and Stone's Sheep, May 20, 2008;
- British Columbia Ministry of Environment (MoE), Wildlife Habitat Area # 9-029, June 11, 2002;
- British Columbia Ministry of Environment (MoE). 2008a. Order – Wildlife Habitat Areas # 9-032, 9-033, 9-034, 9-041, 9-042, 9-043, 9-044, 9-045, 9-046, 9-047, 9-048, 9-049, 9-050, 9-051, 9-052, 9-053, 9-054, 9-055, 9-056, 9-057, 9-058, 9-059, 9-060, 9-061, 9-062, 9-063, 9-064, 9-065, 9-066, 9-067, 9-068, 9-069, 9-070, 9-071, 9-072, 9-073, 9-104, 9-105, 9-104, 9-144 and 9-145 Northern Caribou – Peace Forest District;
- British Columbia Ministry of Environment. 2008b. Order – Wildlife Habitat Areas # 9-035, 9-036, 9-037, 9-038, 9-039, 9-040, 9-102 and 9-103. Northern Caribou – Mackenzie Forest District;
- Cumulative Effects Assessment for the South Peace Region Operational Trial, v 2.3, July 2014;
- Provincial-Level Projection of the Current MPB Outbreak: Update of the infestation projection based on the Provincial Aerial Overview of Forest Health conducted from 1999 to 2012 and the BC MPB model (year 10). BC Ministry of Forests, Lands and Natural Resource Operations, Forest Analysis and Inventory Branch, April 12, 2013;
- Tree Farm Licence 48 – Rationale for Allowable Annual Cut (AAC) Determination, May 25, 2007.
- Sustainable Forest Management Plan 5 for Tree Farm Licence 48, Version 2.6. Canadian Forest Products Ltd. (Canfor). 2011. January 30, 2015;
- Updated Procedures for Meeting Legal Obligations When Consulting First Nations, Interim, Province of British Columbia, May 7, 2010;
- Treaty 8, June 21, 1899;
- Mikisew Cree First Nation v. Canada (Minister of Canadian Heritage), [2005] 3 S.C.R. 388, 2005 SCC 69;
- Haida Nation *v.* British Columbia (Minister of Forests), [2004] 3 S.C.R. 511, 2004 SCC 73;
- Tsilhqot'in Nation *v.* British Columbia, 2014 SCC 44, [2014] 2 S.C.R. 256;

- R. v. Sparrow, [1991] SCR 1075;
- Amended Economic Benefits Agreement, between West Moberly, Doig River, and Prophet River First Nations and the Government of British Columbia, December 17, 2009;
- Forest and Range Resource Management Agreement, between West Moberly, Doig River, and Prophet River First Nations and the Government of British Columbia, May 20, 2010;
- Letter from the Minister of Forests and Range, dated July 4, 2006, to the chief forester, stating the economic and social objectives of the Crown; and
- Letter from the Minister of Forests and Range, dated October 27, 2010, to the chief forester, regarding the economic and social objectives of the Crown regarding mid-term timber supply in areas affected by the mountain pine beetle;
- Public Review Strategy, Tree Farm Licence 48 – Management Plan 5, August 7, 2013;
- First Nations Consultation Report, Canfor Chetwynd, TFL 48, Management Plan 5, September 3, 2014;
- Letter from Canfor to Diane Nicholls, Deputy Chief Forester, regarding Canfor's proposed AAC, dated June 6, 2014;
- Letter from Canfor to Diane Nicholls, Chief Forester, regarding Canfor's proposed AAC, dated March 5, 2015;
- Tour of TFL 48 and associated discussions among Canfor staff, the chief forester and FLNR operations and branch staff on January 21, 2015;
- Technical review and evaluation of current and expected operating conditions and consideration of information received from First Nations and the public at the AAC determination meeting held with FLNR staff in Dawson Creek, B.C. on January 22, 2015.

Role and limitations of the technical information used

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

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

Furthermore, computer models cannot incorporate all of the social, cultural and economic factors that are relevant when making forest management decisions. Technical information and analysis; therefore, do not necessarily provide the complete answers or solutions to forest management decisions such as AAC determinations. Such information does provide valuable insight into potential impacts of different resource-use assumptions and actions, and thus forms an important component of the information I must consider in AAC determinations.

In determining this AAC for TFL 48, I have considered known limitations of the technical information provided. I am satisfied that the information provides a suitable basis for my determination.

Guiding principles for AAC determinations

Section 8 of the *Forest Act* requires the chief forester to consider particular factors in determining the AACs for timber supply areas and tree farm licences. The following guiding principles were developed by the former chief forester and deputy chief foresters and I, as the current chief forester, find them reasonable and appropriate and I have adopted them as described below in making my AAC determination for TFL 48.

Given the large number of periodic AAC determinations required for British Columbia's many forest management units, administrative fairness requires a reasonable degree of consistency of approach in addressing relevant factors associated with AAC determinations. In order to make our approach in these matters explicit, we, the chief forester and deputy chief foresters, jointly established the following body of guiding principles. However, in any specific circumstance in a determination where we consider it necessary to deviate from these principles, we will explain our reasoning in detail.

When considering the factors required under Section 8, we are also mindful of our obligation as stewards of the forests of British Columbia, of the mandate of the Ministry of Forests, Lands and Natural Resource Operations as set out in Section 4 of the *Ministry of Forests and Range Act*, and of our responsibilities under the *Forest Act* and *Forest and Range Practices Act (FRPA)*.

Integrated decision making

One of the key objectives of the Ministry of Forests, Lands and Natural Resource Operations is to take an integrated approach to all resource management decisions that considers all resource values. In considering the factors outlined in Section 8 of the *Forest Act,* we will continue to consider all available information on timber and non-timber resources in the management unit, and all available information on the interactions of the management of those resources on timber supply.

Information uncertainty

Given the complex and dynamic nature of forest ecosystems coupled with changes in resource use patterns and social priorities there is always a degree of uncertainty in the information used in AAC determinations.

Two important ways of dealing with this uncertainty are:

(i) managing risks by evaluating the significance of specific uncertainties associated with the current information and assessing the various potential current and future, social, economic and environmental risks associated with a range of possible AACs; and

(ii) re-determining AACs frequently, in cases where projections of short-term timber supply are not stable, to ensure they incorporate current information and knowledge.

In considering the various factors that Section 8 of the *Forest Act* requires the chief forester to take into account in determining AACs, it is important to reflect those factors, as closely as possible, that are a reasonable extrapolation of current practices. It is not appropriate to base decisions on proposed or potential practices that could affect the timber supply but are not substantiated by demonstrated performance or are beyond current legal requirements.

In many areas, the timber supply implications of some legislative provisions remain uncertain, particularly when considered in combination with other factors. In each AAC determination, this uncertainty is taken into account to the extent possible in the context of the best available information.

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

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

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

We acknowledge the perspective that alternate strategies for dealing with information uncertainty are to delay AAC determinations or to generally reduce AACs in the interest of caution. However, given that there will always be uncertainty in information and due to the significant impacts that AAC determinations can have on communities, we believe that no responsible AAC determination can be made solely on the basis of a response to uncertainty.

Nevertheless, in making a determination, allowances may need to be made to address risks that arise because of uncertainty by applying judgement to the available information. Where appropriate, the social and economic interests of the Crown, as articulated by the Minister of Forests, Lands and Natural Resource Operations, can assist in evaluating this uncertainty.

Climate change

One key area of uncertainty relates to climate change. While some controversy appears to remain on the causes of climate change, there is substantial scientific agreement that climate is changing, that the changes will affect forest ecosystems, and that forest management practices will need to be adapted. Nevertheless, the potential rate, amount, and specific characteristics of climate change in different parts of the province are uncertain. As research provides more definitive information on climate change, we will consider the findings in AAC determinations. Where forest practices are implemented to mitigate or adapt to the potential effects of climate change on forest resources, we will consider related information in our determinations.

In addition, vulnerability assessments can provide information on the potential risks associated with climate change, and could be useful in defining how to consider climate change in different AAC determinations. Such assessments could also highlight key topics in need of research that could improve climate change considerations for future determinations.

We note, however, that even with better information on climate change there will be a range of reasonable management responses. Considerations of how to respond in anticipation of uncertain, potential future impacts and risks differ from those related to responding to known or on-going processes such as the recent MPB infestation. For example, it is not clear if either increases or decreases to current harvest levels would be appropriate in addressing potential

future increases in natural disturbance due to climate change. Conversely, the present forest conditions resulting from the MPB infestation provide a clearer circumstance to which to respond.

To some extent, decisions on the preferred management responses to potential future risks, including potential changes to allowable timber harvests, are appropriately informed by broad discussion among interested parties. We will monitor such discussions and consider them insofar as they are relevant to AAC determinations. In general, the requirement for regular AAC reviews will allow for the incorporation of new information on climate change and its effects on forests and timber supply as it emerges.

First Nations

Aboriginal Title Lands and other areas, such as Treaty Lands or Indian Reserves, are not provincial Crown land. Consequently, the timber on these lands does not contribute to the AAC of the timber supply area or tree farm licence with which they overlap. For other areas, where aboriginal title has not been legally proven, the Crown has a legal obligation to consult with First Nations regarding their asserted rights and title (Aboriginal Interests) in a manner proportional to the strength of their Aboriginal Interests and the degree to which the decision may impact these interests. In this regard, full consideration will be given to:

(i) the information provided to First Nations to explain the timber supply review process;

(ii) any information brought forward respecting First Nations' Aboriginal Interests, including how these interests may be impacted; and

(iii) any operational plans and/or other information that describe how First Nations' Aboriginal Interests are addressed through specific actions and forest practices.

Aboriginal Interests that may be adversely impacted by an AAC decision will be considered, and where appropriate, addressed in a manner that is consistent with the scope of authority granted to the chief forester under Section 8 of the *Forest Act*. When information is brought forward that is outside of the chief forester's jurisdiction, this information will be forwarded to the appropriate decision makers for their consideration. Specific considerations identified by First Nations in relation to their Aboriginal Interests and the AAC determination are addressed in the various sections of this rationale.

AAC determinations should not be construed as limiting the Crown's legal obligations owed to First Nations in any way, and in this respect it should be noted that the determinations do not prescribe a particular plan of harvesting activity within the management units. They are also independent of any decisions by the Minister of Forests, Lands and Natural Resource Operations with respect to subsequent allocation of wood supply.

The role of the base case

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

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

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

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

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

These adjustments are made on the basis of informed judgement using currently available information about forest management, and that information may well have changed since the original information package was assembled. Forest management data are particularly subject to change during periods of legislative or regulatory change, or during the implementation of new policies, procedures, guidelines or plans.

Thus, in reviewing the considerations that lead to the AAC determination, it is important to remember that the AAC determination itself is not simply a calculation. Even though the timber supply analysis I am provided is integral to those considerations, the AAC determination is a synthesis of judgement and analysis in which numerous risks and uncertainties are weighed. Depending upon the outcome of these considerations, the AAC determined may or may not coincide with the base case forecast. Judgements that in part may be based on uncertain information are essentially qualitative in nature and, as such, are subject to an element of risk. Consequently, once an AAC has been determined, no additional precision or validation would be gained by attempting a computer analysis of the combined considerations.

Timber supply analysis

The timber supply analysis for TFL 48 was prepared for Canfor by Ecora Resource Group of Prince George, BC using Patchworks, a spatially explicit optimization model. In Patchworks the analyst sets harvest targets and penalties for not attaining the targets. As a result forecasted harvest levels vary from period to period. In the timber supply analysis, harvest volumes were reported as average values for each of the first two decades, for the next three decades and from the sixth to the 25th decade.

Based on the review by FLNR staff, as well as my own experience reviewing results from similar models, I am satisfied that Patchworks is capable of providing an appropriate projection of timber supply.

Canfor intended to prepare an expedited analysis. With this in mind, much of the same information was used from the most recent previous analysis completed in 2006 under Management Plan 4 (MP4) with some information updated. The majority of the assumptions applied in the 2014 base case are the same as those used in the 2006 analysis.

There were a few differences in the assumptions applied in the 2014 base case compared to the 2006 base case, and these are described below. I will discuss my assessment of any implications of these different assumptions, as well as any implications of using the information from the 2006 analysis under the appropriate factors in this document.

In the base case, harvest flow rules were applied that maximized the short-term salvage harvest of MPB-affected stands while minimizing the impact to mid-term timber supply. Following the salvage harvest of MPB-affected stands, the harvest level declined to the mid-term levels before increasing gradually to an even-flow long-term harvest level.

The base case suggests that an initial harvest level of 1 731 000 cubic metres per year could be maintained for the first five years before declining by 55 percent to 838 000 cubic metres per year for the second five-year period, and a further three percent to 779 000 cubic metres per year for the second decade. Over the next 30 years of the planning horizon, the harvest level decreases to 763 000 cubic metres per year, before gradually increasing to a long-term harvest level of 808 000 cubic metres per year. Deciduous-leading stands contribute 100 000 cubic metres per year to the base case over the 250-year planning horizon.

One significant difference between the 2006 and the 2014 analyses relates to the Phase II Vegetation Resources Inventory (VRI) adjustments. In the 2006 base case, the Phase II VRI adjustments were applied; however, this was not done in the 2014 base case. I am aware of the implications of this to the harvest projections and I will discuss my considerations of this further under 'Forest inventory**'**. Notwithstanding this consideration, I have reviewed the information and I accept this forecast as the base case for the purposes of this determination.

In the analysis the licensee included several alternative harvest flows. One of them showed an initial harvest level of 1 556 000 cubic metres per year for the first five years before declining to 871 000 cubic metres per year for the second five-year period. From year 11 to 30 the level declined further to 737 000 cubic metres per year and from year 31 to 50 to 697 000 cubic metres per year. Thereafter a long-term harvest level of 798 000 cubic metres per year was attained. This forecast reflects the licensee's proposed AAC of 1 550 000 cubic metres for next five years and 871 000 cubic metres for the subsequent five-year period. The licensee indicates that its proposal reflects capacity of field operations in the area. I will discuss this forecast further under '**Reasons for Decision**'.

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

This base case harvest forecast is predicated on the condition of the forest, including the amount of merchantable timber growing stock, at the time the data package was assembled for this analysis. The standing forest was not depleted to account for the potential harvesting of any accumulated unharvested (undercut) volume in this TFL. Therefore, any volume harvested – including undercut volume – above the AAC I determine would constitute use of the growing stock at a greater rate than projected in the base case if the AAC were fully utilized. This could affect the stability of future timber supply.

As discussed and quantified throughout this rationale, and in consideration of the items described above, I am satisfied the information presented to me provides an adequate basis from which I can assess the current timber supply for TFL 48 for this determination.

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

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

Table 1. List of accepted factors

***Forest Act* section and description**	**Factors accepted as modelled**
8(8)(a)(i) Composition of the forest and its expected rate of growth	• Timber Harvesting Land Base • Woodlot Licences • Water • Mine Sites • Roads • Non-Vegetated Land and Vegetated Non-Treed Land • High Elevation Forests (NDT 5) • Forested Islands • Protected Areas • Riparian Reserves and Management Zones • Rare Site Series • Aggregation Procedures • Natural Stand Yields • Log Grades • Site Index • Managed Stand Yields • Operational Adjustment Factors • Minimum Harvestable Ages
8(8)(a)(ii) Expected time that it will take the forest to become re-established following denudation	
8(8)(a)(iii) Silvicultural treatments to be applied	• Regeneration
8(8)(a)(iv) Standard of timber utilization and allowance for decay, waste, and breakage	• Utilization standards • Decay, waste, and breakage
8(8)(a)(v) Constraints on the amount of timber produced by use of the area for purposes other than timber production	• Adjacency (Patch Size Distribution) • Grizzly Bear • Stand-Level Biodiversity • Landscape-Level Biodiversity • Scenic Area Management

(continued)

Table 1. List of accepted factors (concluded)

***Forest Act* section and description**	**Factors accepted as modelled**
8(8)(a)(vi) Any other information	• Land Use Plans • Dunlevy Creek Special Management Area
8(8)(d) Economic and social objectives of the government	• Employment and Community Dependence
8(8)(e) Abnormal infestations in and devastations of, and major salvage programs planned for, timber on the area	• Non-recoverable Loss Estimates

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

Factors requiring additional explanatory consideration

Section 8 (8)

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

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

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

Factors considered under Section 8(8)(a)(i)

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

- *Mountain Pine Beetle epidemic*

The stands on TFL 48 have been impacted by the mountain pine beetle (MPB) epidemic. For the base case, the state of the infestation was measured using year 10 of the Provincial-Level Mountain Pine Beetle Model (BCMPB) projections.

In May 2013, the licensee flew over the TFL in a helicopter to assess the accuracy of the projections. It was determined that the projections accurately represent the location of the most severely impacted stands, but likely underestimate the overall percentage of stands attacked. Specifically, the licensee noted that some areas of low to moderate attack are under-represented in the projections. Overall, however, the licensee believes that the projections from BCMPB year 10 and used in the base case provide a reasonable representation of the state of the infestation on TFL 48.

The licensee estimates that the TFL has 53 million cubic metres of conifer volume on the timber harvesting land base, 18.2 million cubic metres or 34 percent of which is pine. Of this volume, 12.7 million cubic metres (24 percent of the conifer volume on the timber harvesting land base) has been attacked by the MPB.

To account for the limited shelf life of MPB-killed timber, the pine-leading stands in the base case were assumed to maintain their merchantable volume for five years from the start of the analysis horizon, after which all of the pine volume was assumed to be lost. Most of the MPB damage occurred between 2007 and 2009 on the TFL, and thus the analysis assumptions represent an average shelf life for these stands of approximately 10 years. The stands were grouped in the analysis into 10-year age classes, and as a result the actual shelf life by stand in the analysis ranged from 5 to 14 years.

In the base case, the salvage harvest of the MPB-killed stands is projected to occur in the first five years. The stands on TFL 48 are primarily mixed species stands, and therefore salvage harvest of the MPB-killed pine volume includes the harvest of other species. The licensee provided information to demonstrate that the contribution to the base case harvested volume in this first five-year period was predominantly from pine-leading stands, and mostly from stands where pine comprised more than 50 percent of the stand. In this first period, 78 percent of the volume harvested in the base case was from stands with more than 50 percent pine. I also note that Canfor indicated that it expects some stands, assumed in the base case to no longer contribute to timber supply after the first five years of the forecast, will in fact still be merchantable. Canfor expects to target these stands for harvesting after five years elapses.

I have reviewed the information regarding the assumptions to account for the impact of MPB on the stands on TFL 48, and discussed the information with FLNR as well as licensee staff. I have also flown over the TFL and observed the condition of stands. I consider the shelf life assumptions used in the analysis to be reasonable and I am satisfied that the initial higher harvest level demonstrated in the base case is supported by salvage of MPB-killed timber, an important objective for forest management on the TFL.

During the flight over the TFL licensee staff indicated that currently salvage opportunities of dead pine on cable-harvest areas are limited due to a shortage of cable-harvesting contractors. This creates a level of uncertainty for my decision as I note that dead pine from the inventory (regardless of type of harvest required), was used in the analysis which supports the base case. I note that, given the uncertainty regarding salvage of dead pine volume in cable harvesting areas, it is my expectation that the licensee will, to the best of its ability, utilize dead pine on cable ground. I also expect the licensee to review these areas and provide evidence that they should contribute to timber supply for the next timber supply review for TFL 48.

Overall, I am satisfied that the base case provides a reasonable representation of the impact of MPB to the timber supply on TFL 48. I will discuss my considerations of the MPB epidemic and its implications to timber supply on TFL 48 under '**Reasons for Decision**'.

- forest inventory

In the preparation for the 2014 analysis, the forest inventory was updated to the end of 2012 to account for harvesting and to January 1, 2013 to account for stand aging, harvesting and other area or volume depletions. The current Phase I Vegetation Resources Inventory (VRI) is based on a re-inventory performed by the licensee during the term of MP 2.

Phase II ground sampling was completed in 2002 for the TFL, and net volume adjustment factor destructive sampling was completed in 2004. The results of the Phase II ground sampling were used to adjust the height, age and volume attributes for the forest inventory in the 2006 analysis. The adjustments resulted in increased stand heights, decreased stand ages and an increase in the net merchantable volume for stands.

In the 2007 determination, to address some uncertainty about the Phase II inventory plots, the deputy chief forester encouraged the licensee to conduct some additional Phase II ground sampling. However, this work has not yet been completed.

For the 2014 analysis, other than for a few factors as noted elsewhere in this rationale, the assumptions and deductions used to derive the timber harvesting land base were the same as in the 2006 analysis. As a result, the deductions applied to exclude stands for reasons such as low productivity, operability, and problem forest types were based on the site indices and volumes calculated with the Phase II inventory adjustments applied. This led to a 15 percent increase in the timber harvesting land base as compared to analyses prepared for TFL 48 prior to the 2006 analysis.

However, the Phase II adjustments were not applied in the derivation of the volume estimates for existing stands for the 2014 analysis. The average adjustment for the stands on the TFL suggested by the Phase II inventory results in a 37.4 percent increase in existing stand volumes. For stands that were expected to be within the THLB during the sampling process, application of the Phase II adjustment resulted in an 18 percent increase in average volume per hectare.

Ninety-one plots, a satisfactory sample size, were established in the area expected to be THLB. The sampling error was within the targeted 10 percent sampling error with a 95 percent probability. Forest Analysis and Inventory Branch VRI experts indicate these statistics suggest Phase II should have been applied in the base case.

The licensee prepared a sensitivity analysis in which the Phase II adjustments were applied to the existing stand yields. In this sensitivity analysis, an initial harvest level of 2.04 million cubic metres per year (25 percent higher than in the base case) could be maintained for five years. The harvest level then declined to 755 000 cubic metres per year for the second five-year period and 712 000 cubic metres per year for the next decade, levels that are two percent and five percent higher than in the base case forecast. The mid- to long-term harvest levels are six percent and three percent higher, respectively, than in the base case.

Having considered the information about the forest inventory for TFL 48, I note that the Phase II VRI adjustments represent the best available information and should have been applied to volume estimates in the base case. The sensitivity analysis in which the adjustments were applied suggests that the available timber supply on the TFL could be greater than shown in the base case on account of this factor.

I am also aware that the fact that the Phase II VRI adjustments were not applied to the volume estimates, yet used for several factors in the derivation of the timber harvesting land base, results in an unnecessary level of complexity in the information provided. In particular, stands may have been included in the timber harvesting land base following the low productivity, problem forest type and operability exclusions that may never be considered available for harvest by the model, because although they met the minimum site index criteria to be retained in the timber harvesting land base, they may never achieve the 140 cubic metre per hectare minimum volume requirement for harvest. FAIB staff indicate that approximately 38 000 hectares of stands on the timber harvesting land base are never harvested in the model. They note that some of this area is occupied by stands where, in the modelling, the volume contribution from the pine was removed from the total stand volume after the shelf-life expired, resulting in less than 140 cubic metres per hectare.

For this determination I conclude Phase II adjustments should have been applied to existing stand yield estimates. Consistent with this conclusion I accept the factors associated with the Phase II adjustment that lead to the 15 percent increase in the timber harvesting land base. I therefore consider the base case to underestimate the initial five-year period harvest level by 25 percent and the second five-year period level by two percent. I will discuss my considerations of this further under '**Reasons for Decision**'.

I find the large Phase II adjustments for this inventory, particularly in the areas that were not expected to be in the timber harvesting land base during the sampling process, but also for those areas expected to be in the timber harvesting land base, to impart significant uncertainty to this determination. I therefore am including an instruction in this determination for the licensee to develop a robust forest inventory for TFL 48, so as to provide better information for the next determination. In addition, I expect that for the next timber supply review the licensee will consistently apply the same growth and yield information for yield projections and related land base exclusions.

- *inoperable*

In the preparation of information for the analysis, all areas of the TFL were classified according five operability classes: conventional, mixed, cable, aerial and inoperable. Conifer-leading stands identified as aerial or inoperable were excluded in the derivation of the timber harvesting land base. Deciduous-leading stands in all but the conventional operability class were also excluded.

FLNR operations staff reviewed the operability assumptions for the TFL, and indicate that they reflect current practice on the TFL. I expressed my concern about the potential implications for timber supply of the shortage of cable-harvesting contractors above, under 'Mountain Pine Beetle epidemic'.

I will discuss the inclusion of deciduous-leading stands in the conventionally operable land base further under 'Pulpwood agreements, deciduous harvest and partitioned component of the harvest'. Having considered the information regarding operability for TFL 48, I accept that the information is a reasonable reflection of current practice and suitable for use in this determination.

- *cultural heritage resource reductions*

There are 20 known cultural heritage sites on TFL 48, according to information provided by the Archaeology Branch of FLNR. Each site is required to have a one-metre buffer to provide for a measure of protection at the strategic level. The licensee indicates that site specific buffers are applied to these areas operationally when planning harvesting activities.

To account for these areas in the analysis, a one-metre buffer was applied to each area and they were excluded in the derivation of the timber harvesting land base.

The Halfway River First Nation asked the licensee during consultation if the locations of cultural heritage sites are only those provided by Archaeology Branch and if they are not specific to First Nations. The licensee notes that no additional information was provided by public or First Nations about cultural heritage sites on TFL 48 other than the information provided by Archaeology Branch.

I have considered the deductions applied to account for cultural heritage resources on TFL 48, and I accept that known resources were appropriately accounted for in the base case. Other land base deductions applied may provide protection for resources that have not yet been identified, and information that becomes available over this determination can be incorporated into the assumptions for the next timber supply review. I encourage the licensee to continue to work with

the Halfway River First Nation and the other First Nations with traditional territory on TFL 48 to identify and manage for their cultural heritage resources at the operational level.

- recreation

In the timber supply analysis, a recreation inventory completed in 1994 and updated in 2001 was used to determine the exclusions to apply to account for recreation resources.

All areas with a recreation management class of zero were excluded in the derivation of the timber harvesting land base. The licensee indicates that in previous timber supply analyses, recreation class B1 areas were 80 percent included in the timber harvesting land base, as this reflected current management practice. However, they note that in the 2006 and 2014 analyses, all the area classified as B1 was included in the derivation of the timber harvesting land base, because 45 percent of the area was already excluded through other, overlapping reductions.

FLNR operations staff have reviewed the assumptions and indicate that the approach used to reflect management for recreation resources was acceptable and reflective of current practices.

Having considered the information, I accept the assumptions used in the base case to account for management of recreation resources. However, given the importance of managing B1 areas on the TFL and reflecting this management to the best extent possible in timber supply analyses, I request that the licensee review areas classified as B1 that are not otherwise excluded in the derivation of the timber harvesting land base and ensure these are appropriately accounted for in the next timber supply review.

- low productivity sites identified for immature stands

Some immature stands on TFL 48 are not suitable for harvest given the low timber growing potential of the sites.

For the 2006 analysis, the licensee developed minimum site indices for stands by leading species and operability class, and used these to identify low productivity sites. The site indices used were those at which a stand could achieve a certain minimum volume by a defined age of maturity for each species; the minimum volumes were 120, 140 and 150 cubic metres per hectare for stands in the conventional, mixed and cable operability classes respectively. Stands that did not meet the minimum site index criteria were excluded in the derivation of the timber harvesting land base, for a total of 55 710 hectares.

In the 2014 base case, the same areas as in the 2006 analysis were excluded to account for low productivity sites.

I have considered the information regarding the exclusions for low productivity sites. I am aware that the Phase II inventory adjustments were applied in the 2006 analysis, and as a result the site indices used to determine and exclude low productivity sites were adjusted site indices based on the best available information. I have concluded that application of the Phase II adjustments is also appropriate for this determination, and therefore I am satisfied that the exclusions to account for low productivity immature stands in the base case were appropriate, and I make no adjustments on this account.

- mature stand problem forest types

Mature stand problem forest types are stands that exceed the minimum harvest age and are physically operable but are excluded from the timber harvesting land base due to being too old, or of insufficient height, diameter or volume to be considered by Canfor for harvesting at this time. In the 2006 analysis, mature stands that did not meet minimum criteria were excluded in the derivation of the timber harvesting land base, using site indices that included the Phase II inventory adjustments. The same exclusions were applied in the 2014 analysis.

FLNR operations staff have reviewed the assumptions used to account for mature stand problem forest types in the base case, and indicate they reflect current harvesting practices.

I have considered the information regarding mature stand problem forest types, and I am satisfied that the exclusions represent the best available information and are appropriate for this determination. I make no adjustments on this account.

Section 8 (8) (a) (ii) time for re-establishment:

- regeneration delay

In the base case, stands were grouped into separate regeneration eras reflecting regeneration practices of the day, as follows: stands harvested prior to 1995; stands harvested between 1995 and 2008; and stands harvested from 2008 onward including future regenerated stands.

The licensee used the establishment date on the inventory for generating the stand yield tables for the managed stands harvested prior to 1995. These stands totalled 19 005 hectares.

For all managed stands harvested after 1995 except for stands managed using the shelterwood system, a two-year regeneration delay was assumed. For the spruce and balsam stands slated for shelterwood harvest, the regeneration delay was assumed to be zero years.

The licensee no longer uses the shelterwood silvicultural system on TFL 48, as discussed under 'silvicultural systems'. FLNR operations staff indicate that the two-year regeneration delay assumptions reflect current practice on the TFL.

Of the stands to which the zero-year regeneration delay was applied, approximately 2834 hectares were harvested between 1995 and 2008. An additional 18 483 hectares of managed stands assumed harvested after 2008 also had a zero-year regeneration delay applied.

I have reviewed the information regarding the regeneration delay assumptions used in the base case and discussed it with FLNR operations staff. I accept that the regeneration delay applied to shelterwood stands harvested between 1995 to 2008 was appropriate. However, for the stands harvested after 2008, a two-year regeneration delay should have been applied given that shelterwood is no longer used on TFL 48. I note that the discrepancy between what was modelled and current practice has a negligible impact to timber supply, and I make no adjustments on this account. However, it is my expectation that the licensee will ensure the modelling assumptions for regeneration delay accurately reflect current operational practices for the next determination.

- not sufficiently restocked

The licensee indicates there are 709 hectares of low stocking sites on the TFL that were previously considered to be backlog not-satisfactorily-restocked area. These areas, harvested prior to 1987, were grouped into analysis units and assigned low stocking densities for generation of the yield curves in the base case.

FLNR operations staff confirm that the approach used in the analysis was reflective of current conditions on the TFL. However, Forest Analysis and Inventory Branch (FAIB) staff note that review of the analysis information suggests only 470 hectares were modelled with low stocking assumptions.

In considering this information, I accept that the discrepancy in these two areas is small and has a negligible impact on timber supply. For this determination, I accept the assumptions as modelled; however, I expect the licensee will ensure low stocking sites are reflected accurately for the next determination.

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

- silvicultural systems

The current silvicultural system in use on TFL 48 is clearcut harvesting.

The licensee used the shelterwood system until 2008 to harvest mature and over-mature uneven-aged two-layered stands on the TFL; these stands were primarily balsam stands with spruce understorey or spruce with a balsam understorey. In the 2006 analysis, the use of this silvicultural system was reflected by the application of an extra five percent operational adjustment factor (OAF) to account for shading and a regeneration delay of zero years following harvest, as discussed above.

The additional OAF was not applied in the 2014 base case, as the shelterwood system is not currently used on the TFL.

I have reviewed the information regarding the reflection of silviculture systems in the analysis. I note that it would have been appropriate to apply the additional OAF in the base case for the approximately 2834 hectares of stands that were harvested using shelterwood prior to 2008. However, due to small size of this area to which this additional OAF applies, I accept that the impact to timber supply is negligible and I make no adjustments on this account. I encourage the licensee to review the yield projections for the shelterwood harvested stands to ensure the expected yields are accurately reflected in the next timber supply review for TFL 48.

FLNR operations staff indicate that experience suggests stands previously targeted for shelterwood harvest can be difficult to regenerate following harvest if clearcut. I expect the licensee to ensure that stands previously slated for harvest under the shelterwood silvicultural system are being harvested and managed in such a way as to ensure successful stand regeneration.

- genetic improvement

Select spruce seed was first used on TFL 48 in 2003. Between 2003 and 2008, approximately 2747 hectares or 18 percent of the area planted over that time was planted with select spruce seedlings with a genetic gain of 3.7 percent. Between 1995 and 2003, approximately 12 144 hectares were planted with spruce seed without a genetic gain.

The licensee states that since 2008, they have used select seed wherever available on the TFL, and about 55.5 percent of planted spruce stock has been from select seed with an average genetic gain of 11.4 percent. The licensee indicates that select pine stock is very limited and for the most part is not available for use on the TFL.

For the base case, the licensee calculated a weighted genetic gain value based on a zero percent genetic gain from 1995 to 2003, and a 3.7 percent gain from 2003 to 2008. This weighted value of .7 percent was applied to yield curves for the stands planted between 1995 and 2008 to account for select seed use. For stands planted after 2008, it was assumed that the spruce component was regenerated using 100 percent class A spruce seed, and an 11.4 percent genetic gain was applied.

I am aware that the analysis assumptions include use of select seed for all spruce planted since 2008 on the TFL, which is greater than the 55 percent use in current practice. If the discrepancy continues, this could result in an overestimation of the yield from managed spruce, and correspondingly of timber supply in the mid- to long-term on this account. The licensee indicates that it intends to use select seed whenever possible in the regeneration of stands on TFL 48.

While I accept the assumptions around the use of select seed for this determination, I expect the licensee to track and report on its use so that current practice can be reflected appropriately in the next determination for TFL 48.

Section 8 (8) (a) (iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area:

No factors considered under this section require additional comment.

Section 8 (8) (a) (v) the constraints on the amount of timber produced from the area that reasonably can be expected by use of the area for purposes other than timber production:

Factors considered under Section 8(8) (a)(v)

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

- ungulate winter range

In the 2006 base case, a total of 1983 hectares after other reductions were excluded to account for ungulate winter range in the Dunlevy Special Management Area. These same areas were excluded in the derivation of the 2014 timber harvesting land base.

Since the 2006 analysis was completed, two new ungulate winter ranges were established that overlap with the TFL. Ungulate winter range U-9-002 is for northern caribou, mountain goat and bighorn sheep, and U-9-004 is for northern caribou and Stone's sheep. The two ranges cover a total of 21 918 hectares. A variety of general wildlife measures apply to operational activity in these areas, which the licensee indicates do not require explicit reflection in the analysis. There are portions of the ungulate winter ranges that have been designated as 'no harvest', and these were explicitly excluded from the timber harvesting land base in the 2014 analysis. A total of 2271 hectares after previous reductions was excluded from the timber harvesting land base.

The licensee indicates that 478 hectares of the excluded Dunlevy area overlaps with the new ungulate winter range area designated as no harvest. The remainder of the Dunlevy area, approximately 1515 hectares, is no longer managed for ungulates.

FLNR operations staff concur with the information provided by the licensee.

I have reviewed the information presented about ungulate winter ranges on TFL 48, and I accept that operational practices on the areas not restricted from harvest were adequately reflected without explicit modelling. I note that 1515 hectares in the Dunlevy area now contribute to timber supply on the TFL, and as a result the timber harvesting land base has been underestimated by approximately 0.4 percent. I will discuss my considerations of this further under '**Reasons for Decision**'.

- wildlife habitat areas

Sixteen new wildlife habitat areas (WHA) covering 22 252 hectares of productive forest have been established in the area of TFL 48 since the 2006 analysis, primarily for caribou calving and rutting. These areas were identified and explicitly excluded in the derivation of the timber harvesting land base for the 2014 analysis, for a total of 1377 hectares after other deductions. A WHA for bull trout is also located on TFL 48. The area excluded from the THLB for this WHA was 74 hectares.

As described further under 'First Nations considerations', during the information sharing process undertaken by Canfor and the consultation process with FLNR, the West Moberly First Nations expressed concern regarding disturbance to critical habitat defined in the draft *'Action Plan for the Klinse-Za Herd of Woodland Caribou'* due to the licensee's planned harvesting activities. They further expressed an interest to initiate discussion about an approach to forest development

that would be consistent with the recovery of the herd as outlined in the action plan, and included draft measures, including for maximum disturbance levels, from the action plan. They also commented that the harvest level increase proposed by Canfor would not be consistent with reducing disturbance.

In response to the concerns expressed by the West Moberly First Nations, Canfor prepared a sensitivity analysis in which the draft maximum disturbance level information provided by the West Moberly First Nations with the draft measures from the action plan were applied broadly. The sensitivity analysis showed that timber supply on TFL 48 would be reduced by 46 percent over the forecast period. In order to attempt to better reflect how these levels and measures might be applied operationally, the licensee requested information about the planning zones from the action plan, but this information had not yet been developed. Specifically, the author of the plan indicated that shape files are not available for the areas because the primary and secondary caribou management zones and the moose enhancement area are conceptual and further work is required to delineate these areas.

FLNR operations staff note that the action plan is not endorsed by the BC government. The Province has engaged in its own process for the management of seven herds of northern caribou, including the Klinse-za herd, through the '*Implementation Plan for the Ongoing Management of South Peace Northern Caribou (Rangifer tarandus caribou pop. 15) in British Columbia'* (the 'Implementation Plan'). Standardized Industry Management Practices (SIMPs) as part of this plan are currently under development. Consultation will begin with stakeholders and First Nations during 2015. The SIMPs would apply to areas of high and low elevation caribou habitat outside of existing ungulate winter ranges and wildlife habitat areas.

In accordance with my guiding principles, as neither of these plans has been endorsed by government, it would be inappropriate to take either plan into account for this determination. However, should government endorse either of these plans, it will be considered in future determinations.

Having considered the information regarding wildlife habitat areas, I accept the exclusions in the base case were appropriate for this determination. I acknowledge the licensee for TFL 48 for its management operationally for caribou habitat. Once the SIMPs from the Implementation Plan are available, I expect the licensee to apply them in their operations on the TFL, and I have included an instruction to that effect under '**Implementation**'. I will take into account any timber supply impacts that arise from the application of the SIMPs in the next determination for TFL 48.

- *watershed objectives*

In the 2014 analysis no explicit accounting for watershed objectives was applied. The licensee provided a sensitivity analysis in which the maximum peak flow index assigned to each watershed in the TFL was enforced using Equivalent Clearcut Area (ECA) and projected hydrological recovery. The sensitivity analysis suggested that timber supply was reduced by between four and six percent across the planning horizon.

The licensee indicates that it manages operationally for peak flow index threshold values, as committed to in their Sustainable Forest Management Plan 5 (SFMP), and does not manage operationally for ECAs. A review conducted by the licensee and provided to FAIB staff indicates that none of the harvesting activity in the watersheds on the TFL has violated the peak flow index thresholds.

I have considered the information presented regarding watershed objectives. Although SFMPs are not legal documents, they are an expression of operational commitments and I expect the licensee to continue monitoring the management for peak flow index thresholds as committed to in its SFMP, as well as incorporate accounting for these management practices in the analysis for the next AAC determination for the TFL.

- disturbing the non-contributing land base

Forested areas outside the timber harvesting land base, known as the non-contributing land base because it does not contribute to timber supply, generally do contribute to meeting many non-timber objectives. As these areas are assumed to meet various objectives, it is important to ensure naturally-occurring disturbances in the areas are reflected in projections of timber supply.

No natural disturbance provisions were applied to the non-contributing land base in the 2014 base case for TFL 48.

I have reviewed the information provided and find the lack of accounting for this factor in the base case to be of concern. Reflecting expected natural disturbance rates in timber supply analyses is important to ensuring the land base is able to support various forest management objectives. It is my expectation that this will be appropriately modelled in the next analysis for TFL 48. I consider that timber supply is overestimated on this account by an unknown amount, and I will discuss my considerations of this further under '**Reasons for Decision**'.

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

<u>- Factors considered under Section 8(8) (a)(vi)</u>

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

- pulpwood agreements, deciduous harvest and partitioned component of harvest

Deciduous-leading forest types (aspen and cottonwood) cover about 52 000 hectares of the timber harvesting land base of TFL 48. Approximately 67 percent of the TFL overlaps with Pulpwood Agreement 13 (PA13). PA13 allows for up to 200 000 cubic metres per year of volume from mature, deciduous-leading stands to be harvested from the TFL 48 area, the Dawson Creek TSA and the Fort St. John TSA.

In the base case, deciduous-leading stands contribute 100 000 cubic metres per year to the harvest forecast over the entire forecast period.

A sensitivity analysis in which the Phase II inventory adjustments were applied to the volume estimates for existing deciduous stands showed an increased volume contribution was possible for the first 50 years of between 17 and 19 percent. The mid- to long-term volume contribution was 102 000 cubic metres per year.

The 2007 determination included a 100 000 cubic metre partition from deciduous and coniferous trees within deciduous-leading stands. At that time, the deputy chief forester requested that the licensee monitor the harvesting performance in those stands. Records show that in 2011, 100 518 cubic metres of volume from deciduous-leading stands was harvested on TFL 48. However, deciduous-leading harvest levels in 2010, 2012 and 2013 were lower, and over those

four years the deciduous-leading harvest averaged about 57 000 cubic metres per year. In 2014, no volume from deciduous-leading stands was harvested on TFL 48.

FLNR operations staff indicate economic activity has increased since 2011, and there are now several facilities either open or planned that would use deciduous volume.

I have considered the information regarding the demand for deciduous volume from TFL 48 as well as the volume projections over time from deciduous-leading stands shown in the base case forecast. The base case was supported by a harvest contribution of 100 000 cubic metres per year from deciduous-leading stands. I am aware that the manufacturing facilities in the vicinity of TFL 48 can make use of deciduous volume, and there is an expectation that demand will increase over the term of this determination. I am also mindful of the harvest forecast that showed with Phase II adjustments applied to stand volumes, the initial harvest level of deciduous volume could increase by almost 20 percent without impacting the mid- to long-term volume contribution from these stands.

Past performance suggests uncertainty still exists about whether the 100 000 cubic metre level will be achieved operationally. The current contribution shown in the base case was harvested only once in recent years. In consideration of all the above, I conclude that for this determination it is appropriate to maintain the partition from deciduous-leading stands at 100 000 cubic metres. I will discuss this further under '**Reasons for Decision**'.

As a final note, I am aware that it is difficult to determine whether deciduous volume in mixed stands is effectively used on the TFL, from review of volume harvest records. I expect the licensee to utilize deciduous species in mixed stands wherever possible, so as to ensure maximum value from these stands.

- harvest performance in balsam stands

Balsam-leading stands cover approximately 12.6 percent of the timber harvesting land base of TFL 48.

In the base case, balsam-leading stands contribute an average of 58 000 cubic metres per year for the first 50 years of the harvest forecast, and 85 000 cubic metres per year thereafter. This correlates to a contribution of approximately 7 and 12 percent, respectively, to the mid- and long-term harvest level in the base case.

Ministry staff note that balsam harvest on TFL 48 has been limited. Ministry staff assessed the harvest billing information and found that between 2004 and 2013, an average of 0.6 percent of the actual volume harvested from the TFL was balsam.

The licensee indicates their manufacturing facility can handle 25 to 30 percent of its consumption from balsam. Recent harvest has focused on MPB-killed stands, and balsam has not been a priority.

I have reviewed the information regarding the contribution assumed in the base case from balsam stands and harvest performance. Mid- to long-term timber supply as shown in the base case is dependent on a 7 to 12 percent contribution from these stands, and therefore a lack of harvesting performance could suggest the stands should not be included in the timber harvesting land base. I acknowledge that harvest over the past few years has been focussed appropriately on salvage of timber from MPB-attacked stands. As well, I am aware the licensee has stated their facilities are suited to processing an appropriate level of balsam harvest.

In consideration of the above, including the minimal level of harvest performance in these stands over the past 10 years, I note that continued avoidance of harvest in these stands will reduce mid- to long-term timber supply. I expect the licensee to evaluate balsam-leading stands to ensure that only those that are expected to be harvested are included in the timber harvesting land base, and provide evidence to that effect. Any required changes to the assumptions can be incorporated into the next timber supply review.

- cumulative effects

The effects of mining, oil and gas, wind energy and timber harvesting may combine to cause unintended cumulative effects (CE) on other resources or values on TFL 48. Treaty 8 First Nations with traditional territory overlapping parts of TFL 48 and the surrounding TSAs have expressed concern about the CE's of industrial development on the exercise of their Treaty 8 rights. I will discuss this further under 'First Nations considerations' below.

The Province recognizes the importance of assessing and managing the CE of resource development in Northeast British Columbia and is developing and implementing the Cumulative Effects Framework (CEF) to provide the policy, procedures and tools to improve the consideration of cumulative effects in natural resource decision-making. With this management approach, the effects of resource development on a number of environmental, social and economic values, including: biodiversity, riparian conditions, water and air quality, fish and wildlife habitat and populations, cultural and heritage concerns, community needs and economic development opportunities, form part of natural resource decision making processes.

The CEF was developed by the Province in 2013. As part of the CEF, operational trials were implemented in a number of areas including one in the South Peace area. This led to the establishment of the Northeast Cumulative Effects Program in spring 2014, which tailors application of CEF in British Columbia's Northeast region. The Northeast CE Program incorporates the work completed in the previous South Peace CE demonstration project, as well as the BC Oil and Gas Commission's Area Based Analysis. In Fall 2015, the Northeast CE Program will be engaging with First Nations, stakeholders and various levels of government through the Northeast Strategic Advisory Committee to finalize the 2014/15 assessment report and develop management direction to support natural resource decision-making. According to provincial staff, they are working closely with the Treaty 8 First Nations, local government and local industry associations on the development and implementation of the program.

CE values have been managed at the strategic level in an integrated manner through land use planning, objective setting, designation of parks and protected areas, legislation (e.g. the *Forest and Range Practices Act* and regulations) designation of special management areas, (e.g., wildlife habitat areas for species at risk, ungulate winter ranges), and the establishment and enforcement of sustainable harvesting levels (e.g. allowable annual cut or wildlife harvest allocations). Under the CEF the current status of values on the landscape are measured through CE assessments. These will provide information that will assist in industrial, including forest, planning and management. In the assessments, maps and reports are provided on the condition of the value in relation to government policy objectives established using the various strategic tools described above. Following CE assessment, the next steps in the Northeast CE program are management and monitoring.

Currently CE assessment reports for old forest, riparian habitat and high-priority wildlife species, including Grizzly bear populations and priority wildlife habitat in Northeast British Columbia are nearing completion.

When making an AAC determination, I am provided with a base case that incorporates all of government's current objectives to manage the values that are present on the management unit. The inventory and land base information used in the base case reflect all industrial activities and non-timber resource uses on the land base of the management unit and the forest cover inventory is updated for disturbances such as timber harvesting and fires. In the modelled harvest projections the current values and objectives are managed and protected.

The base case timber harvesting land base is the area remaining after all other resources and resource uses, identified and established by other statutory decision makers, have been accounted for. For example, ungulate winter ranges, wildlife habitat areas and riparian zones are excluded from the timber harvesting land base, and the intent of protecting these areas is to provide for habitat for animals. As described under 'ungulate winter range' above, 21 918 hectares on TFL 48 were recently established as ungulate winter range for northern caribou, mountain goat, bighorn sheep and Stone's sheep and excluded from the timber harvesting land base. In addition, as described under 'wildlife habitat areas' above, 22 252 hectares were established as wildlife habitat area primarily for caribou calving and rutting areas and these were also excluded. In the base case the rate of timber harvesting on established visually sensitive areas and some wildlife habitat areas is also constrained to maintain visual quality and cover for wildlife.

A further total area of 2236 hectares covered by current and proposed mines and 1176 hectares of oil and gas well sites, camps, sumps, road access and borrow pits were excluded from the timber harvesting land base. Seismic lines, pipelines, trails and transmission lines identified on the TFL were also excluded as vegetated non-treed lands. FLNR operations staff note that wind power generation is of high potential in the area but no projects are operating on the TFL at this time.

According to Canfor, it has developed a process for tracking oil and gas activities on TFL 48. Canfor notes that the oil and gas activities on the TFL primarily use the existing road network or, where new roads are required, work with Canfor on the placement to meet the needs of both. In Sustainable Forest Management Plan 5 Canfor commits to track, monitor and report every three years to their Public Advisory Committee losses to other non-forest industry uses and incorporate these losses when preparing for AAC determinations.

I have discussed the status of the Cumulative Effects Program in the Northeast with FLNR staff. As stated previously, the Northeast CE program is just starting an engagement phase which will finalize the 2014/15 assessment report and will begin the development of management direction for those values assessed. Engagement of First Nations will occur through their participation on the Northeast Strategic Advisory Committee, as well as through engagement individually with each First Nation.

In addition to considering the potential impacts on other forest resources such as wildlife, riparian areas and old growth that I am required to take into consideration under Section 8 of the *Forest Act*, I have reviewed the information presented to me regarding cumulative effects on TFL 48. Both the Provincial Cumulative Effects Framework and the Northeast Cumulative Effects Program are in the process of developing further assessments and associated management considerations. The information I was provided that describes the current management in place for several values, tracking of the impacts of multiple industries, coordination between the oil and gas sector and forest sector for development activities, reporting to the Public Advisory Committee, and engagement mechanisms that are in place assist me in considering cumulative effects in this determination. I accept that the licensee is collecting information and monitoring the impacts to the best of its ability at the current time.

To assist in ongoing CE assessment, I have included an instruction under '**Implementation**' to direct the licensee to continue to engage with First Nations, as well as the mining and oil and gas industry and government representatives, to understand the implications of CE for timber supply

on TFL 48. Any new and relevant information emerging from additional CE assessment work can be reflected in the next timber supply review for the TFL. If CE information becomes available that suggests timber supply on TFL 48 will be significantly affected, I can re-determine the AAC sooner than in the 10 years allowed by legislation.

- *First Nations considerations*

The Crown has a duty to consult with, and accommodate if necessary, those First Nations for whom it has knowledge of Aboriginal Interests that may be impacted by a decision, including strategic-level decisions such as AAC determinations. I must therefore consider information arising from the consultation process with First Nations respecting Aboriginal Interests that may be affected by my AAC determination for TFL 48. As well, I will consider other relevant information available to the Province regarding Aboriginal Interests, including information gathered during other consultation processes.

In considering whether the Crown has fulfilled its obligations for consultation and accommodation in relation to my ACC determination, I note that my authority under the *Forest Act* is to determine the AAC. My decisions are independent of any decisions by the Minister of Forests, Lands and Natural Resource Operations with respect to harvesting activities or subsequent allocations of wood supply. Furthermore, AAC determinations should not be construed as limiting the Crown's legal obligations owed to First Nations in any way.

TFL 48 is within the geographical area covered by Treaty 8. In the case of Treaty 8 First Nations, the duty to consult is triggered when a proposed decision or activity could potentially impact the Treaty 8 right to hunt, trap or fish.

Five First Nations have traditional territories that overlap the TFL 48 area. These are the McLeod Lake Indian Band, West Moberly First Nations, Halfway River First Nation, Saulteau First Nations and the Blueberry River First Nations. All are signatories to Treaty 8. The West Moberly First Nations, Halfway River First Nation and the Saulteau First Nations are members of the Treaty 8 Tribal Association. This Association has been an incorporated organization under the *BC Societies Act* since 1982 and was created to provide advisory services to member First Nations. The West Moberly First Nations are signatories to the Forests and Range Resource Management Agreement (FRRMA) and were consulted through the FRRMA Board as outlined in Appendix B, Matrix: Guidance for Consultation Processes on MFR Decisions.

The West Moberly First Nations and Saulteau First Nations have Indian Reserves that are directly adjacent but outside of the TFL area. Consequently the timber on these reserve lands does not contribute to the AAC I have determined for the TFL 48 area.

In June 2014, the Supreme Court of Canada (SCC) released its decision on the Tsilhqot'in Nation v. British Columbia case (Tsilhqot'in decision). All five of the First Nations with traditional territory in TFL 48 are signatories to Treaty 8, and since aboriginal title claims were surrendered as part of the terms of Treaty 8, the Tsilhqot'in decision does not have application to Treaty 8 First Nations. Consultation obligations with respect to Treaty 8 rights, as outlined in the SCC Mikisew, Sparrow and Haida decisions, apply in TFL 48. I discuss the consultation process conducted for this AAC determination below.

On August 28, 2013 Canfor initiated information sharing on the Tree Farm Licence 48 Timber Supply Analysis Data Package with the McLeod Lake Indian Band, West Moberly First Nations, Halfway River First Nation, Saulteau First Nations and the Lheidli-T'enneh First Nation. On February 10, 2014 Canfor initiated information sharing on the Tree Farm Licence 48 Management Plan 5, which includes the Data Package and the Timber Supply Analysis, with the First Nations listed immediately above.

FLNR operations staff conducted initial impact reviews of potential impacts the proposed AAC decision and management plan approval may have on Treaty 8 rights, and how any such impacts or other First Nation concerns are proposed to be addressed. Based on the reviews, the impacts of these decisions on the Treaty 8 rights of the McLeod Lake Indian Band, West Moberly First Nations, Halfway River First Nation, and the Saulteau First Nations was assessed to be low and the consultation level was proposed at the normal level of the consultation spectrum. This level is consistent with the level for TSR assigned in the Matrix in the FRRMA. The proposed consultation levels were conveyed to each of these four First Nations during the consultation process described below.

On February 24, 2014 FLNR operations staff initiated consultation on the two pending decisions, the determination of the AAC for TFL 48 and possible approval of Management Plan 5 for TFL 48, with the McLeod Lake Indian Band, West Moberly First Nations (through the FRRMA Board), Halfway River First Nation and the Saulteau First Nations.

FLNR operations staff did not consult with the Lheidli-T'enneh First Nation based on FLNR's assessment that TFL 48 falls outside the boundaries of its traditional territory. This First Nation is not a signatory to Treaty 8. They provided no input into Canfor's information sharing.

At the time of the information sharing and consultation the Blueberry River First Nations' traditional territory did not overlap with TFL 48. Therefore Canfor did not share the information provided to the other First Nations on August 28, 2013 or February 10, 2014, nor did FLNR operations staff consult with the Blueberry River First Nations at that time.

On May 26, 2014, after the official consultation period for the AAC determination and Management Plan 5 approval had ended, the Ministry of Aboriginal Relations and Reconciliation notified the Blueberry River First Nations of the change to the consultation area boundaries that the Province would be implementing for consultation with the Blueberry River First Nations as follows. Based on an examination of the First Nation`s claimed traditional territory, the Province implemented a three zone area approach to be used to guide consultation processes. The consultation level was dependant on within which of the zones the proposed activity is located.

TFL 48 falls within Consultation Area B and the consultation level in that area is the 'notification' level of the consultation spectrum as outlined by the Supreme Court of Canada Haida decision.

On August 5, 2015, FLNR operations staff notified the Blueberry River First Nations of the pending AAC determination and the decision regarding Management Plan 5 for TFL 48. Draft Management Plan 5, including the Data Package and Timber Supply Analysis, were appended to the letter. In the letter, FLNR staff asked the Blueberry River First Nations to provide input on how the draft Management Plan 5 for TFL 48 and the assumptions in the timber supply analysis may impact the First Nation's Treaty 8 rights. The Blueberry River First Nations were reminded that TFL 48 is located in Area B and that therefore the Province would consult at the notification level. They were asked to provide input by September 11, 2015. On September 1, 2015 FLNR operations staff sent the Blueberry River First Nations an e-mail reminding them of the pending decisions.

The McLeod Lake Indian Band, Saulteau First Nations, Blueberry River First Nations and, as mentioned above, the Lheidli-T'enneh First Nation provided no input into this process.

As described above under 'wildlife habitat areas', in their communication with Canfor, the West Moberly First Nations expressed concern about the unresolved discussion concerning the draft 'Action Plan for the Klinse-Za Herd of Woodland Caribou (*Rangifer tarandus caribou*) in Canada' as well as the impact of cumulative effects on the landscape.

Following the official end of the consultation period in April, 2014, the West Moberly First Nations continued to express concerns over the pending AAC determination at FRRMA Board meetings. At a FRRMA Board meeting in January, 2015 FLNR resource management staff provided a presentation on the *Government Actions Regulation* process and other legislative mechanisms in place for protection of wildlife and wildlife habitat.

In March, 2015 FLNR operations staff sent the FRRMA Board a letter summarizing the consultation process and listing the three major concerns that had been expressed by the West Moberly First Nations concerning this AAC determination. These were regarding the adequacy of planning for caribou, the harvest level proposed by Canfor and the effect harvesting of beetle-killed pine stands would have on the remaining live spruce and aspen stands, and that in the West Moberly First Nation's opinion there had not been consultation on the management plan.

Finally, at the April 2015 FRRMA Board meeting the West Moberly First Nations again expressed concern over caribou management and harvesting of 'beetle-killed' wood. They indicated they have not had any substantive resolution with any of this with Canfor and that they are having discussions with the Province but it is premature to make a decision.

The Halfway River First Nation participated in the consultation process, indicating that they are mostly concerned about the area around Dunleavy/Butler Ridge in the most northerly block of the TFL. They noted the analysis includes no specific First Nations consideration other than caribou in the Dunleavy area (Dunleavy Special Management Zone). They also noted that cultural heritage sites accounted for in the analysis are only those provided by the Archaeology Branch, and that they are not specific to First Nations. The Halfway River First Nation also requested that Canfor provide them with operational information including plans for using pesticides in the area and specifically how Canfor is going to protect or enhance First Nations interest in this area. The licensee responded to the request for operational information and noted that they would consider input from the Halfway River First Nation any time.

While the Blueberry River First Nations did not raise any specific concerns regarding the level of consultation employed or this AAC determination during the consultation period, I am aware that the Province has received input from this First Nation on other provincial referrals. The Blueberry River First Nations have raised concern over the consultation process, and cumulative effects on Treaty 8 rights.

Regarding the West Moberly First Nation's concern about caribou management, I discussed my conclusions regarding caribou management under the 'wildlife habitat areas' factor. I further note that while the Province does not endorse the draft Klinse-Za action plan, many aspects of this plan and the 'Implementation Plan' prepared by the Province are similar. I am encouraged that the West Moberly First Nations and the Province are continuing the dialogue about this issue. I have accounted for current management of caribou in this determination. If management practices for caribou change, the changes will be accounted for in future determinations.

Regarding the salvage of beetle-killed pine, I have considered that the economic value of this resource will be lost if it is not harvested before it deteriorates and becomes unmerchantable. In addition, the harvested areas will be regenerated following harvest and a new forest will grow on

these areas much sooner than if these stands were not harvested. I have instructed the licensee to report on the amount of live and dead timber harvested annually to ensure Canfor concentrates its activities in stands with a high proportion of dead pine. Finally, the increased AAC will be in place for five years after which the AAC will decline to what is essentially the long-term harvest level for TFL 48.

Regarding The West Moberly First Nation's concern about cumulative effects, I have discussed the current status of management for this topic above, under 'cumulative effects'.

I have also considered the input from the Halfway River First Nation and the licensee's response. I am aware that exclusions from the timber harvesting land base applied in the base case to account for various resource values may provide for a measure of protection of cultural heritage values in the absence of site-specific information regarding these values at the current time. I am satisfied that the licensee is committed to working with the Halfway River First Nation to share information and address site-specific concerns operationally.

The Blueberry River First Nations are generally concerned about consultation processes and I note that they were provided with the initial impact review conducted by operations staff, as well as Draft Management Plan 5, the timber supply analysis and the data package. They provided no comment regarding the content of these documents and did not suggest the level of consultation should exceed the 'notification' level.

The Blueberry River First Nations have expressed a general concern about how cumulative effects of industrial activity are affecting their Treaty 8 rights of hunting, trapping and fishing. I understand all the Treaty 8 First Nations with traditional territory on TFL 48 have similar concerns. I have described above under 'cumulative effects' what the current status is of the cumulative effects program in the Northeast Region. I mentioned that the base case harvest forecast is a reflection of the current condition of the land base and current management, or a reasonable extrapolation of current management. All the provisions currently enacted or established or that form a part of current management that are aimed at protecting values that contribute to the protection of Treaty 8 rights are reflected in the base case and either do not contribute to timber supply or constrain timber supply during the 250-year forecast period. In addition many areas are excluded from contributing to timber supply for other reasons such as high elevation areas, unstable terrain, stands that are unmerchantable or low timber growing potential, and stands described as mature stand problem forest types from a timber management perspective.

In making an AAC determination I review each of the base case factors that describes current performance and I evaluate with FLNR staff if these assumptions indeed represent current practice and the best available information. Having considered each of the factors**,** where warranted I make adjustments to the harvest levels projected in the base case to reflect my understanding of all available and relevant information, and factor these adjustments into my determination. The AAC determination is a strategic decision. I have no authority in legislation or through the AAC determination process to direct the timing, location and nature of harvesting operations. Those decisions are made by other statutory decision makers. As elucidated in the 'guiding principles', AAC determinations should not be construed as limiting the Crown's legal obligations owed to First Nations in any way.

Opportunities were provided to all First Nations to share their concerns related to specific aboriginal interests that may be impacted by this decision. If new information regarding First Nations' aboriginal interests becomes available that significantly varies from the information that was available for this determination and that may affect timber supply, a new TSR can be initiated leading to a determination sooner than the maximum 10 years allowed by legislation.

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

Factors considered under Section 8(8) (b)

- *alternative rates of harvest*

In addition to the base case, the licensee provided five alternative harvest flows for the coniferous component of the timber supply. The assumptions used for the majority of these harvest forecasts, other than harvest flow assumptions, were the same as those used in the base case.

One scenario assessed the impact of imposing a 1.5 million cubic metre per year maximum harvest limit on the forecast. In this scenario, the mid-term timber supply was reduced by three to four percent. According to the licensee, this suggests that mid-term timber supply would be reduced if salvage harvesting is less than what is shown in the base case.

Two of the alternative harvest forecasts assessed the timber supply implications of scenarios designed to maximize salvage in the first five-year period. These were prepared by the licensee in part to evaluate the intended salvage strategy for the MPB-killed stands on TFL 48. In one alternative forecast, the initial harvest level attained was 2.53 million cubic metres per year. In this forecast, the mid-term level attainable was approximately eight percent lower than in the base case. In a second forecast, the visual quality objectives on the TFL were not modelled to assess their impact on timber supply. The initial harvest level attained in this scenario was 2.58 million cubic metres per year, with mid- and long-term levels three and four percent higher than the base case, respectively. In this scenario, visual quality objectives were violated for most of the planning horizon. The licensee concluded that neither scenario presented a more effective salvage strategy than what is presented in the base case.

I have reviewed the information presented to me regarding alternative harvest flows, which provide information about the timber supply dynamics on TFL 48. I note that the alternative flows suggest that the higher short-term harvest levels shown in the base case do not unduly impact the mid- to long-term timber supply on the TFL.

The salvage of MPB-killed volume is important to forest stewardship and supporting a transition to healthy stands for the mid-term. I have considered the information provided in the base case as well as these alternative flows in my determination.

Section 8(8) (c) repealed [2003-31-2 (B.C. Reg. 401/2003)]

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

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

Factors considered under Section 8(8) (d)

- *Minister's letter*

The Minister of Forests and Range (now the Minister of Forests, Lands and Natural Resource Operations) expressed the economic and social objectives of the Crown for the province in a letter to the chief forester, dated July 4, 2006. Two of the government's stated goals are to create more jobs per capita than anywhere else in Canada, and to lead the world in sustainable environmental management. The Minister asked for consideration, during AAC determinations, of the importance of a stable timber supply in maintaining a competitive and sustainable forest industry while being mindful of other forest values.

In respect of this, in the base case projection described earlier in this document, a primary objective in the harvest flow was to attain a stable, mid- and long-term harvest level where the growing stock also stabilizes. I have also considered with care the adequacy of the provisions made both in current practice, and assumed in the analyses, for maintaining a range of forest values.

The Minister also emphasizes the mountain pine beetle outbreak in the interior of British Columbia. He indicates that of particular relevance to AAC determinations are the objectives of encouraging long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land use plans.

As well, the Minister requested that the chief forester consider the local social and economic objectives expressed by the public, and information received from First Nations.

The Minister sent a second letter to the chief forester on October 27, 2010, in which he expressed objectives regarding mid-term timber supply in areas affected by the mountain pine beetle.

I am satisfied that the timber supply analysis for TFL 48 in combination with information from, and discussions with, Ministry and licensee staff has provided me with the information necessary to make a determination for TFL 48 that meets the objectives expressed in these letters.

The licensee made the draft timber supply analysis information package available for public review and First Nations information sharing from August 26 to November 15, 2013. Draft Management Plan #5 was made available for review from February 12 to April 11 of 2014. The licensee received input from the public as well as First Nations.

FLNR staff consulted with First Nations between February and April 2014. Other than responding with a comment on the deadline for consultation, the only input received from the First Nations during the consultation process was directed to the licensee.

I have considered the objectives expressed by the Minister in my determination for TFL 48. Where appropriate, I have discussed the input from the public and First Nations in the relevant sections of this rationale document.

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

Factors considered under Section 8(8) (e)

- *fires*

Non-recoverable loss estimates applied in the base case included an accounting for losses due to fire of 44 605 cubic metres annually. These estimates are based on expected fire losses from historical data.

Seven fires burned on TFL 48 during the 2014 fire season. Although the majority of the fires were small with a negligible impact, one of these fires, the McAllister Fire, was large. The licensee estimates that this fire impacted 11 052 hectares of the timber harvesting land base, corresponding to 1.9 million cubic metres or 3.7 percent of the coniferous growing stock on the TFL. About 75 percent of the area burned was covered in stands greater than 80 years of age, and these stands contained almost all of the timber volume burned. Approximately 22.6 percent of the volume burned was from dead pine impacted by the MPB, and the remainder was from balsam and spruce.

FAIB staff suggested that mid-term timber supply for the TFL might be slightly reduced as a result of the loss of green spruce and balsam volume from the McAllister Fire. In order to provide a better understanding of the potential impact to timber supply, the licensee conducted an additional sensitivity analysis that accounts for the fire damage. The results suggest negligible impact to long-term timber supply, but an impact of up to 25 000 cubic metres per year to the short- and mid-term, or 1.4 and three percent, respectively.

Having reviewed the information and discussed it with FLNR staff, I accept that the lack of accounting in the base case for the impact of the McAllister Fire indicates short- and mid-term timber supply on TFL 48 has been overestimated by up to 25 000 cubic metres per year. I will discuss my considerations of this further under '**Reasons for Decision**'.

Reasons for Decision

In reaching my AAC determination for TFL 48, I have considered all of the information under Section 8 of the *Forest Act* and I have reasoned as follows.

The MPB epidemic is currently the most significant factor affecting timber supply on TFL 48, and the salvage of MPB-killed timber continues to be of paramount importance. I am satisfied that the base case appropriately reflected the impact of the MPB, and I note that over the next five year period, there is an opportunity to attain value from stands impacted by the beetle before the shelf life of the killed trees renders them unsuitable for milling.

There are a number of factors discussed in this document that suggest the timber supply shown in the base case might be underestimated. These include the following:

> *Forest inventory* – the Phase II VRI adjustment was not applied to the inventory information, resulting in an underestimation of the volume available in existing stands, and a corresponding 25 percent underestimation of timber supply for the first five years, two percent for the next five years, and thereafter ranging between three and six percent in the mid- to long-term compared to the base case;

> *Ungulate winter range* – accounting for additional area excluded to account for ungulate winter ranges that are no longer managed for caribou habitat results in an underestimation of timber supply of approximately 0.4 percent;

There are also a number of factors that suggest timber supply in the base case might be overestimated, as follows:

> *Disturbing the non-contributing land base* – the lack of reflection of natural disturbance patterns on the non-contributing land base results in an overestimation of timber supply by an unknown amount;
>
> *Fires* – accounting for the recent large McAllister Fire suggests short- and mid-term timber supply could be overestimated by up to 1.4 and three percent, respectively;

In addition, I am aware that there is a level of uncertainty in a number of factors affecting timber supply on the TFL that do not impact the short-term timber supply, but potentially introduce uncertainty to the mid-term supply suggested by the base case. These factors include the extent to which operational practices around the use of select seed and shelterwood harvesting systems have been sufficiently reflected in the base case. Ongoing and future evolving management practice requirements for caribou SIMPS, wildlife habitat areas, and to address cumulative effects also lead to uncertainty as to whether the base case harvest forecast has provided an appropriate mid-term harvest level on TFL 48 that fully addresses management for various resource values.

As noted earlier under 'Timber supply analysis', the licensee has proposed a harvest level of 1 550 000 cubic metres per year for the first five years and 871 000 cubic metres per year for the following five-year period. I note that this suggested initial harvest level is 10 percent lower than that shown possible in the base case, and I accept the licensee's assessment that it reflects contractor capacity in the area. The second five-year period level is about four percent higher than the level projected in the base case. I consider the impact on this alternative forecast of any overestimation of short-term timber supply suggested by the factors above coupled with the factors that suggest timber supply has been underestimated by the base case projection to provide assurance that setting an initial harvest level of 1 550 000 cubic metres per year does not present risk to longer term timber supply on TFL 48. In addition, I note that the higher harvest level for the second five-year period compared to the base case provides for more opportunity to salvage beetle-killed pine trees, should any remain merchantable at that time.

A number of factors introduce uncertainty to the mid-term timber supply, and better information would clarify any impacts for the next determination for TFL 48. The potential influence of these factors on mid-term timber supply on the TFL suggests that it may be appropriate to determine an AAC for TFL 48 sooner than the 10 years required by legislation.

The previous AAC for TFL 48 included a partition to deciduous stands which was reflected in the base case harvest level provided by the licensee. Having reviewed the information discussed under 'pulpwood agreements, deciduous harvest and partitioned component of harvest', including the availability of and demand for deciduous volume on TFL 48, I am satisfied that it is appropriate to maintain a partition for deciduous-leading stands at 100 000 cubic metres for this determination.

Considering all these factors together, I determine an appropriate harvest level for TFL 48 at this time is 1 550 000 cubic metres for the next five years, followed by an AAC of 871 000 cubic metres for the following five-year period. My expectation is that the licensee will focus on harvesting stands with a high component of dead pine for the first five years. I also expect the licensee will harvest stands with the highest possible merchantable dead pine component during the second five-year period of this determination.

As I have noted throughout this rationale, including under '**Implementation**', I am concerned that the quality of the information for many of the assumptions discussed above, for example dead pine salvage on cable ground, harvesting performance in balsam, existing stand volumes, regeneration delay and natural disturbance in the non-contributing land base, introduces uncertainty for mid- to long-term timber supply. It is my expectation that the licensee will thoroughly review the information and ensure better information is available for the next timber supply review for TFL 48.

Determination

I have considered and reviewed all the factors as documented above, including the risks and uncertainties of the information provided. It is my determination that a timber harvest level that accommodates objectives for all forest resources during the next 10 years and that reflects current management practices as well as the socio-economic objectives of the Crown, can be best achieved on TFL 48 by establishing an AAC of 1 550 000 cubic metres for the next five years, followed by an AAC of 871 000 cubic metres for the following five-year period. I also specify, under Section 8(5)(a) of the *Forest Act*, that 100 000 cubic metres are attributable to deciduous and coniferous trees in deciduous-leading stands.

This determination is effective on October 15, 2015 and will remain in effect until a new AAC is determined, which must take place within 10 years after the date of this determination.

If additional significant new information is made available to me, or major changes occur in the management assumptions upon which I have predicated this decision, then a new timber supply review can be initiated leading to a determination sooner than in the 10 years allowed by legislation.

Implementation

In the period following this determination and leading to the subsequent determination, it is my expectation that Canfor will undertake tasks and investigations that will be important to help reduce the risk and uncertainty associated with key factors that affect timber supply on TFL 48. I expect Canfor to:

- Develop a robust inventory for TFL 48 so as to provide better information for the next determination. In addition I expect that for the next timber supply review the licensee will consistently apply the same growth and yield information for yield projections and related land base exclusions.
- Remain apprised of the Standardized Industry Management Practices (SIMPs) being developed for caribou management as part of the *Implementation Plan for the Ongoing Management of South Peace Northern Caribou*, and incorporate these into operational management as soon as they are available.
- Continue to engage with First Nations, mining and oil and gas stakeholders and FLNR operations staff to collect information regarding cumulative effects and reflect the best available information in the next timber supply review.
- Report to the FLNR district manager on harvest performance by species and by dead and live wood on an annual basis.

While the above tasks are the highest priority, I also note that, as mentioned elsewhere in this rationale document, there are several factors for which information used for this analysis introduces a level of uncertainty to the mid- to long-term timber supply. As noted earlier, this analysis was intended to be expedited to address MPB salvage, and I accept the information used for this determination. However, it is my expectation that the licensee will provide a robust analysis and better information, including a complete assessment of all factors affecting timber supply, for the next timber supply review for TFL 48.

Diane Nicholls, RPF
Chief Forester

October 15, 2015

Appendix 1: Section 8 of the *Forest Act*

Section 8 of the *Forest Act*, Revised Statutes of British Columbia 1996, c. 157, (consolidated to September 30, 2015), reads as follows:

Allowable annual cut

8 (1) The chief forester must determine an allowable annual cut at least once every 10 years after the date of the last determination, for

(a) the Crown land in each timber supply area, excluding tree farm licence areas, community forest agreement areas and woodlot licence areas, and

(b) each tree farm licence area.

(2) If the minister

(a) makes an order under section 7 (b) respecting a timber supply area, or

(b) amends or enters into a tree farm licence to accomplish a result set out under section 39 (2) or (3),

the chief forester must make an allowable annual cut determination under subsection (1) for the timber supply area or tree farm licence area

(c) within 10 years after the order under paragraph (a) or the amendment or entering into under paragraph (b), and

(d) after the determination under paragraph (c), at least once every 10 years after the date of the last determination.

(3) If

(a) the allowable annual cut for the tree farm licence area is reduced under section 9 (3), and

(b) the chief forester subsequently determines, under subsection (1) of this section, the allowable annual cut for the tree farm licence area,

the chief forester must determine an allowable annual cut at least once every 10 years from the date the allowable annual cut under subsection (1) of this section is effective under section 9 (6).

(3.1) If, in respect of the allowable annual cut for a timber supply area or tree farm licence area, the chief forester considers that the allowable annual cut that was determined under subsection (1) is not likely to be changed significantly with a new determination, then, despite subsections (1) to (3), the chief forester

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

(b) must give written reasons for the postponement.

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

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

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

(4) If the allowable annual cut for the tree farm licence area is reduced under section 9 (3), the chief forester is not required to make the determination under

subsection (1) of this section at the times set out in subsection (1) or (2) (c) or (d), but must make that determination within one year after the chief forester determines that the holder is in compliance with section 9 (2).

(5) In determining an allowable annual cut under subsection (1) the chief forester may specify that portions of the allowable annual cut are attributable to one or more of the following:

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

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

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

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

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

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

(a) the community forest agreement, and

(b) any directions of the chief forester.

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

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

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

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

(iii) silviculture treatments to be applied to the area,

(iv) the standard of timber utilization and the allowance for decay, waste and breakage expected to be applied with respect to timber harvesting on the area,

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

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

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

(c) [Repealed 2003-31-2.]

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

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

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

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

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

(b) each tree farm licence area

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

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

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

Section 4 of the *Ministry of Forests and Range Act* (consolidated to September 30, 2015) reads as follows:

Purposes and functions of ministry

4 The purposes and functions of the ministry are, under the direction of the minister, to do the following:

(a) encourage maximum productivity of the forest and range resources in British Columbia;

(b) manage, protect and conserve the forest and range resources of the government, having regard to the immediate and long term economic and social benefits they may confer on British Columbia;

(c) plan the use of the forest and range resources of the government, so that the production of timber and forage, the harvesting of timber, the grazing of livestock and the realization of fisheries, wildlife, water, outdoor recreation and other natural resource values are coordinated and integrated, in consultation and cooperation with other ministries and agencies of the government and with the private sector;

(d) encourage a vigorous, efficient and world competitive

(i) timber processing industry, and

(ii) ranching sector

in British Columbia;

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

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

BRITISH COLUMBIA

JUL 0 4 2006

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

Dear Jim:

Re: Economic and Social Objectives of the Crown

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

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

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

Minister of Forests and Range and Minister Responsible for Housing

Office of the Minister

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

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

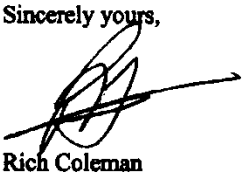
Jim Snetsinger

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

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

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

Sincerely yours,



Rich Coleman
Minister

Appendix 4: Minister's letter of October 27, 2010

BRITISH COLUMBIA
The Best Place on Earth

RECEIVED
NOV 0 1 2010
CHIEF FORESTER'S OFFICE
EXECUTIVE
MINISTRY OF FORESTS

File: 280-30/MPB
Ref: 126097

OCT 2 7 2010

Jim Snetsinger, Chief Forester
ADM Forest Resource Stewardship Division
Ministry of Forests and Range
3rd Floor, 1520 Blanshard Street
Victoria, British Columbia
V8W 3C8

Dear Mr. Snetsinger:

Re: Economic and Social Objectives of the Crown Regarding Mid-Term Timber Supply in Areas Affected by the Mountain Pine Beetle

On July 4, 2006, Rich Coleman, former Minister of Forests and Range, wrote to you outlining the social and economic objectives of the Crown for AAC determination (in accordance with Section 8 of the *Forest Act*) with respect to issues associated with the Mountain Pine Beetle (MPB) epidemic. The aforementioned letter articulated the Crown's objectives of ensuring long-term economic sustainability for communities affected by the epidemic; recovering the greatest value from dead timber before it burns or decays, while respecting other forest values; and conserving the long-term forest values identified in land use plans. I am writing to you regarding the Crown's objectives with respect to mid-term timber supply in areas affected by the mountain pine beetle.

The MPB infestation has had a profound impact on the timber supply outlook for the interior of the province. In particular, forecasts of timber supply in the mid-term—the period between the ending of the economic shelf life of killed pine and the time when the forest has re-grown and again become merchantable—are now significantly lower than prior to the infestation. These shortages threaten the wellbeing of forest-dependent cities and towns. The

Ministry of Forests and Range and Minister Responsible for Integrated Land Management Bureau
Minister's Office
Mailing Address:
P.O. BOX 9049 Stn Prov Govt
Victoria, BC V8W 1X4
Tel: (250) 387-6240
Fax: (250) 387-1040
Website:
gov.bc.ca/forilmbwww.gov.bc.ca

Jim Snetsinger, Chief Forester

Government of British Columbia is working closely with beetle action committees, municipalities, and the private sector to diversify economies. However, for many forestry-dependent towns mid-term timber supply shortages could still have significant socio-economic impacts.

During this challenging time it will be necessary to reassess management objectives and administrative approaches that were developed when forest conditions in the province's interior were very different than now exist. In this reassessment it will be important to enhance the understanding of how best to balance objectives for non-timber forest values with objectives for timber supply to achieve a range of socio-economic benefits. It will also be important to assess how innovative practices and incremental silviculture could mitigate mid-term timber supply shortfalls in MPB affected areas, and if flexibilities can be found in timber supply administration.

During the Timber Supply Review process, in addition to the considerations included in the July 2006 letter, I would like you to undertake analysis that can provide information on how changes to current management practices and administration could increase mid-term timber availability in MPB-affected areas. This information should be shared with Ministry of Forest and Range Executive and used to inform discussions among interested parties, and considered by appropriate land use and management decision makers. If formal changes are made to management objectives and administration, you will be in a position to incorporate those changes in Timber Supply Reviews and AAC determinations.

Sincerely,

Pat Bell
Minister

pc: Dana Hayden, Deputy Minister