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In the London Court of International Arbitration
No. 111790

THE UNITED STATES OF AMERICA,

Claimant,

v.

CANADA,

Respondent.

CANADA'S STATEMENT OF DEFENCE

NON-CONFIDENTIAL

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GLOSSARY OF ABBREVIATIONS

Abbreviation	Description
AD	Antidumping
AMP	Average Market Price
B.C.	British Columbia
BCTS	British Columbia Timber Sales
C&E	Compliance and Enforcement
CVD	Countervailing Duty
EBBMA	Emergency Bark Beetle Management Area
EC	Economy Lumber Grade
Ha	Hectare (Unit of Measurement)
HBS	Harvest Billing System
ILC	Intermountain Logging Conference
ISAC	Interior Scaling Advisory Committee
ITC	International Trade Commission
LRF	Lumber Recovery Factor
mbf	One Thousand Board Feet of Lumber (Unit of Measurement)
MPB	Mountain Pine Beetle
MPS	Market Pricing System
rad	Radius Class Unit (Unit of Measurement)
RPF	Registered Professional Forrester
SIFR	Southern Interior Forest Region
SLA	Softwood Lumber Agreement
SPF	Spruce-Pine-Fir
ST	Stud Lumber Grade
TSA	Timber Supply Area
TSL	Timber Sales License
U.S.	United States
WWPA	Western Woods Products Association
2B	Standard #2 and Better Lumber Grade
3U	Utility Lumber Grade

CANADA’S STATEMENT OF DEFENCE

INTRODUCTION

1. The United States seeks, in its Statement of Case, to transform the effects of a natural disaster on British Columbia’s forests into a calculated evasion of Canada’s obligations under the anti-circumvention provisions of Article XVII of the Softwood Lumber Agreement of 2006 between Canada and the United States (the “Agreement” or the “SLA”).¹ It does this by advancing two distinct arguments. First, the United States claims that because its sole witness, Dr. Neuberger, cannot explain why the percentage of British Columbia’s pine harvest represented by timber graded as “Grade 4” increased between 2007 and 2009, this Tribunal should draw an inference that this increase *must have* resulted from the deliberate misgrading of that timber. Canada refers to this as the United States’ “inferential” case. Second, the United States alleges that the Government of British Columbia took four actions that changed the grandfathered provincial timber grading and scaling system in ways that made logs more *likely* to be misgraded as Grade 4, and that “{t}his *increased likelihood* ... was a benefit to BC softwood lumber producers and exporters,”

¹ 2006 Softwood Lumber Agreement between the Government of Canada and the Government of the United States of America, Sept. 12, 2006 (“SLA 2006”) (Ex. R-1).

thus breaching the anti-circumvention provisions of the SLA.² We refer to this argument as the United States’ “actions” case.

2. The central factual assertion on which the United States seeks to erect its claim is that “the mountain pine beetle does not impair the quality of timber.”³ That statement is demonstrably untrue, as we will explain in detail below. The Mountain Pine Beetle (“MPB”) kills the trees it infests. At the moment of death, the wood from an MPB-killed tree will show a distinctive blue stain, but will otherwise be as sound as it was at the moment before death. But the death of a tree commences a process of deterioration that, over about two years, first dries out and then starts to crack the timber. Drying makes timber brittle, and cracking (called “checking” in the trade) makes it difficult to cut boards that are not themselves cracked. Checking manifests itself in most cases after a tree has been dead for about two years, after which the condition of dead timber only worsens, but at a slower rate. As the spread of the MPB infestation outpaced the ability of the British Columbia lumber industry to harvest the trees killed by the MPB, the pine harvest came gradually to consist of a large volume of pine timber that had been dead more than two years. The quality and structure of that dead, dried wood *was* affected, directly and adversely, by the MPB.

² Stmt. of Case ¶ 96 (emphasis added).

³ Stmt. of Case ¶ 4.

3. This inconvenient fact, along with many others, does not appear in the Statement of Case submitted to this Tribunal by the United States. The United States has not put before the Tribunal the evidence of any witness with actual experience managing a forest, harvesting timber, or manufacturing lumber. Nor has it put forward a witness, who has studied the behavior of the MPB, the qualities and structure of wood affected by the MPB, the effects of death and desiccation on a tree, or how a lumber mill processes dead wood. Instead, the United States relies entirely on a solitary economist, who tries valiantly, undaunted by the absence of such expertise and experience, to address all of these subjects.

4. The United States' first argument – the inferential case – depends on the logical fallacy that eliminating a series of possible explanations for a phenomenon justifies drawing an inference that the phenomenon must be the result of wrongdoing. Canada will show that the inference of misgrading that the United States asks the Tribunal to draw from Dr. Neuberger's inability to explain the facts is uninformed, unsupported and demonstrably wrong.

5. The United States' inferential case rests on two faulty premises: (1) that the SLA implicitly imposed a ceiling, purportedly anticipated as of April 2006, on the percentage of British Columbia's pine harvest that could properly be graded as Grade 4; and (2) that the accuracy of log grading can be judged by how well it predicts the quantity and value of the lumber a mill will be able to make from a log, such that a significant increase in Grade 4 logs unaccompanied by a significant decline in the quantity and value of lumber produced must

demonstrate misgrading. Canada will show that the April 2006 grading changes were not a condition of the SLA, that no one in Canada pretended to be able, in 2006, to anticipate all effects that the MPB might have on British Columbia's pine harvest for the duration of the SLA, and that the SLA did not guarantee a particular percentage of Grade 4 logs. Canada will also demonstrate that the U.S. assertion that a "true decrease in log quality would have resulted in a decrease in the quantity of lumber manufactured from those logs"⁴ both mistakes the relationship between timber quality and lumber production and overlooks the actual effect on British Columbia's lumber of a mounting supply of dead, dry timber.

6. From these faulty premises, the United States seeks to lead the Tribunal down three erroneous lines of reasoning, all of which are based on its economist's speculations and all of which are wrong: (1) that the increases in the percentage of timber graded as Grade 4 had no relationship to the effects of the MPB on the physical characteristics of the timber harvested in the B.C. Interior; (2) that Dr. Neuberger's inability to find evidence of a decline in lumber volume and value shows that the increase in the percentage of Grade 4 logs in the harvest cannot be explained by the low quality of those logs; and (3) that relative lumber volume and value recoveries from MPB-killed and non-MPB-killed logs during trials

⁴ Stmt. of Case ¶ 66.

conducted at four Interior sawmills in 2007-2008 demonstrate misgrading of lodgepole pine throughout the Interior harvest.⁵

7. Each of these lines of reasoning is contrary to fact.
- First, Canada will show that the rise in the percentage of the harvest that was graded “Grade 4,” the centerpiece of the Statement of Case, is directly attributable to the effects of the MPB attack on the quality of British Columbia’s timber harvest. The physical effects of the MPB on timber quality began to manifest themselves dramatically after the SLA was signed, as the proportion of the pine harvest that had been dead for more than two years began to mount. In considering the United States’ statements about the increase in the percentage of the pine harvest graded as Grade 4, however, the Tribunal should keep in mind that the total volume of British Columbia’s pine harvest declined steadily from 2006 through 2009, so that a large shift in the percentage of pine graded as Grade 4 corresponds to smaller increases in the actual volume.
 - Second, Canada will explain why the United States’ economist is mistaken in claiming that misgrading should be inferred from data related to the output of

⁵ See, e.g. Stmt. of Case ¶¶ 69, 72, 78, 94.

British Columbia's lumber mills. This data in fact establishes what Dr. Neuberger claims *should have* accompanied the increase in Grade 4: a decline in both the volume and value of lumber produced in the B.C. Interior. Beginning in 2005, what had been a steady climb in British Columbia's lumber recovery leveled off, and the quality and value of the resulting lumber began to decline, as the effects of the MPB infestation began to be felt. These effects were moderated only by vigorous efforts and significant capital expenditures on the part of British Columbia's industry to improve milling practices and technology to adapt them to making use of timber of deteriorating quality. In addition, the industry was able to develop new markets, notably in China, for increasing quantities of lumber of lower quality than British Columbia had produced before the MPB attack.

- Finally, Canada will show that the U.S. reliance on the four mill studies does nothing to support its allegation that logs were misgraded as Grade 4. Among other things, the studies were never intended to be representative of mills throughout the Interior or of the timber profile at the time.

8. The United States' inferential case also fails to meet the legal standard for establishing a circumvention claim under Article XVII. To do so, the United States would have to show: (1) that a government – in this case, British Columbia – has taken an action; (2) that the action has provided a grant or other benefit; and (3) that the benefit was

provided to exporters or producers of Canadian Softwood Lumber Products. The inferential case identifies no action by British Columbia, nor any benefit to Canadian lumber producers other than some assumed benefit flowing from the rising percentage of Grade 4 timber in the harvest. Perhaps because it recognizes these shortcomings in its inferential case, the Statement of Case changes gears at page 46 to present the United States' second line of argument, its actions case.

9. The United States' actions case finally acknowledges that Article XVII of the SLA requires that a claim of circumvention commence with identification of a government action alleged to have breached the duty not to circumvent the substantive terms of the SLA. The Statement of Case identifies four so called "changes" or "actions" by British Columbia that the United States contends circumvented the SLA: (1) encouraging lumber scalers to use local knowledge; (2) the Scaling Requirements for Checked Logs; (3) kiln re-drying; and (4) encouraging scalers to engage in the practice of bucking.

10. Other than this belated concession that some government action is a necessary and essential predicate for any circumvention claim, the United States' actions case reflects the same disregard for the legal requirements of Article XVII and the evidentiary burdens they place on the complaining party that are evident in its inferential case. This is most apparent in the U.S. assertion that the four actions merely "*increased the likelihood*" that

logs would be misgraded,⁶ and that this alleged “likelihood” of misgrading, without more, is sufficient to satisfy the United States’ burden of establishing the provision of a “benefit” under Article XVII(2)(a). As discussed further below, this turns Article XVII on its head, and flies in the face of the Tribunal’s recognition in LCIA Case No. 81010 that the Party claiming circumvention “must show not only that a benefit was *potentially* provided but that it was *indeed* provided.”⁷

11. The first and last of these so called “actions” can be dismissed quickly. The first took the form of an e-mail from a B.C. Ministry of Forests and Range (“Ministry”) employee in February 2007 encouraging the development and sharing of “local knowledge” about timber grading when conditions were wet.⁸ The last took the form of an administrative communication from a Ministry employee in November 2008 requesting that a joint industry-government committee “develop enhanced scaling practices,” mischaracterized by the United States as a memorandum encouraging “bucking” (cutting logs to shorter lengths).⁹ Neither of these communications rises to the level of a government “action.” Neither effected any change to British Columbia’s scaling system nor

⁶ Stmt. of Case ¶ 96 (emphasis added).

⁷ 81010 Award ¶ 242 (CA-6) (emphasis in original).

⁸ Stmt. of Case ¶ 100 (citing C-45 (E-mail from Steve Laberge (Feb. 2, 2007) at CAN-010975)).

⁹ Stmt. of Case ¶¶ 135-137 (citing C-83 (Letter from Ministry to ISAC (Nov. 13, 2008) at CAN-011867)).

had any identifiable effect on actual practice. Both, in any event, are grandfathered under Article XVII(2)(a) of the SLA.

12. The two remaining “actions” identified by the United States were a set of scaling requirements issued by the Ministry on December 1, 2007 (the Scaling Requirements for Checked Logs or Scaling Requirements),¹⁰ eight months after the United States complains that the percentage of Grade 4 timber in the harvest began to increase, and the authorization, at about the same time, of the practice of re-drying or “warming” a load of logs in a kiln.¹¹

13. “Scaling” involves measuring the volume of harvested logs and then grading those logs for quality.¹² The Scaling Requirements issued by the Ministry simplified the application of the basic grading standards and made their application more accurate and consistent by providing guidance to scalers about how to calculate the effect on log grade of “checks” (cracks) in MPB-killed logs. Such an improvement in accuracy cannot constitute a benefit, and therefore, cannot result in circumvention of the SLA, but the Scaling Requirements are, in any event, grandfathered, or alternatively, safe-harboured under Article XVII(2)(a).

¹⁰ C-82 (Memorandum from Bill Howard (Nov. 28, 2007) at CAN-011402).

¹¹ Stmt. of Case ¶¶ 118-119.

¹² Typically, this means that a subset of loads is subject to manual measurement and grading, with the results applied to other loads on a sampling basis.

14. The practice of kiln warming or re-drying logs was developed because MPB-killed logs lose and absorb moisture faster than “green” logs cut from a live tree, and therefore have a tendency to swell up when exposed to wet weather or wet ground conditions. Such swelling makes it difficult to see the longitudinal checks in logs that tend to develop when a tree dries out, and which reduce the proportion of the volume of the log from which fracture-free lumber (boards) can be cut.

15. The Statement of Case would lead one to conclude that the kilns used for re-drying logs resemble a fiery furnace. As explained in Section II.B.3, however, these kilns are large enclosed sheds built for drying lumber under controlled temperature and humidity conditions, into which kiln carts of logs can be driven, and in which logs are allowed to dry out in conditions no more extreme than might prevail on a warm summer’s day in the British Columbia Interior. The expert report of Dr. Luiz Oliveira, the scientific advisor to the Ministry in connection with its authorization of kiln re-drying, explains that the re-drying of logs under the conditions authorized does not cause new checks or aggravate existing checks enough to affect log grade.¹³ Rather, kiln re-drying allows existing checks to be seen and measured. This practice improves the accuracy of scaling and therefore, again, cannot be regarded as providing a benefit. Even if the Tribunal were to find that the practice provided a benefit and that it represented a modification of the grandfathered regime, the

¹³ Expert Report of Luiz C. Oliveira (hereinafter “Oliveira Report”) ¶ 62 (Ex. R-11).

Tribunal could only find circumvention if it also found that the practice failed to maintain or improve the extent to which stumpage charges reflect market conditions. Without such a finding, the practice is safe harboured under Article XVII(2)(a).

16. If the Tribunal finds, as Canada contends, that none of the challenged “actions” is in breach of Canada’s obligations under Article XVII, there will be no need to address the compensatory adjustments to be applied in the event that Canada should fail to cure the breach. If, however, the Tribunal finds that Canada has circumvented the Agreement, the Tribunal must determine, pursuant to Article XIV(22), the reasonable period of time for Canada to cure its breach and the appropriate adjustments to the Export Measures to compensate for the breach.

17. In its Statement of Case, the United States proposes that an “appropriate remedy” must account for “the benefits that Canada has provided to its softwood lumber industry in violation of the SLA.”¹⁴ Based on the calculations of Dr. Neuberger, the United States estimates the benefits received by Canadian producers to be C \$499.2 million through March 12, 2012.¹⁵ On this basis, the United States seeks to recoup that same amount from

¹⁴ Stmt. of Case ¶ 158.

¹⁵ Stmt. of Case ¶ 186.

B.C. Interior softwood lumber producers by imposing additional export taxes on their exports to the United States over the remaining life of the SLA.¹⁶

18. The U.S. proposed remedy is flawed in every relevant respect. First, Dr. Neuberger’s benefit calculations relate *entirely* to the United States’ inferential case, which presumes that all Grade 4 logs above the level that existed between May 2006 and April 2007 were misgraded. Dr. Neuberger made no attempt to determine whether any of the four actions the United States claims constitute circumvention in fact caused misgrading, let alone measure to what extent such actions conferred a benefit. Dr. Neuberger’s benefit calculations are thus divorced entirely from the only cognizable claim under Article XVII the United States has presented – its “actions” case. Second, even on their own flawed terms, Dr. Neuberger’s benefit calculations contain egregious calculation errors, addressed in detail in Section III.B below. Finally, the United States’ proposed “recoupment” remedy is directly contrary to the text of the SLA (which requires compensatory adjustments to compensate for the *offset or reduction* of the Export Measures *caused by* the benefits received).¹⁷ The Statement of Case provides the Tribunal with no guidance whatsoever about how to calculate or assess whether any such alleged benefits to the B.C. industry caused any offset or reduction to the Export Measures.

¹⁶ Stmt. of Case ¶ 187.

¹⁷ 81010 Award ¶ 348 (CA-6).

19. The United States has evidently left that calculation for another day, and for good reason. During most of the period about which the United States complains, from 2006 through 2009, timber prices on both sides of the Canada-United States border declined, along with the decline in demand attributable to the collapse of the U.S. housing market. But prices for timber fell more sharply in the United States in 2007, 2008, and 2009 than they did in British Columbia,¹⁸ precisely the opposite of what one would expect if British Columbia was artificially depressing the price of timber by misgrading logs. And during those same years and continuing in 2010, the share of the U.S. lumber market represented by imports from British Columbia fell from its high of 19 percent in 2006 to 18 percent in 2007, 16 percent in 2008, and 16 percent again in 2009 and 2010.¹⁹ If British Columbia had actually been flooding the market with cheap timber (the raw material for lumber), one would have expected its share of the U.S. lumber market to have risen. Neither of these trends suggests that there has been any adverse effect on the Export Measures, and certainly does not show any effect on the scale claimed by the United States.

20. This Statement of Defence begins by putting the present dispute into context. Part I of the Context Section provides a brief examination of the pertinent provisions of the

¹⁸ See Forest Economic Advisors, LLC, Quarterly Lumber Forecasting Service (May 2011) and Quarterly Timber Forecasting Service (September 2011), available at <http://www.getfea.com/>; B.C. Ministry of Forests, Lands and Natural Resource Operations, Forest Industry Snapshot, available at <http://www.for.gov.bc.ca/het/analysis-snapshot.htm>.

¹⁹ Expert Report of Joseph P. Kalt (hereinafter “Kalt Report”), Fig. 2 (Ex. R-9).

SLA, with emphasis on the provisions grandfathering and safeharbouring the forest management and timber pricing practices of British Columbia, the importance of which, to the Parties, is evident from the express terms of that document.

21. Part II of the Context Section describes British Columbia's forest management, timber pricing, and log grading systems. Addressing the shortcomings of the U.S. inferential case requires an understanding of these systems, and specifically of some of the complexities of British Columbia's methods of managing, classifying, grading, and selling timber from its forests. Two of these systems are at the heart of this case:

- First, the B.C. Interior log grading system, used in the Interior region of British Columbia, defines log grades principally in terms of the percentage of a log deemed physically available for the manufacture of lumber (defined as "fracture-free" lumber) and the percentage of such lumber that would meet defined criteria of merchantability. The most important definition for purposes of this case, heavily relied on by the United States,²⁰ is the "50/50" rule applicable to lodgepole pine. That rule requires that, to qualify as a Grade 2 log, a log must have 50 percent of its volume available (as calculated pursuant to British Columbia's Scaling Manual) for the manufacture of lumber, of which volume 50 percent would be merchantable lumber. A

²⁰ See, e.g. Stmt. of Case ¶¶ 35, 40, 42, 69, 70, 91, 94, 96, 97, 101, 110, 112, 113, 117, 120, 131.

Grade 4 log is defined as one that fails to meet the Grade 2 standard. Part II.B.1 explains how the United States misconstrues this rule as one that predicts how much lumber a mill will actually produce from a log, something the rule does not do.

- Second, the B.C. Interior Market Pricing System (“MPS”) provides the mechanism by which timber harvested by B.C. lumber producers is priced by reference to competitive auctions of sample lots. The United States’ accusation that B.C. “has systematically underpriced timber”²¹ rests on a fundamental misunderstanding of the MPS system. Part II.B.2 explains how the prices for all logs sold in B.C., whether they are Grade 2 or Grade 4, are set by MPS by reference to market transactions.

22. Both British Columbia’s MPS and log grading system are designed to provide a market-based system for pricing and capturing the value of British Columbia’s timber in an accurate and consistent manner, and both are grandfathered by the SLA.

23. Part III of the Context Section describes the MPB infestation that has afflicted British Columbia and its devastating impact on British Columbia’s forests and forest industry. It also addresses the challenges faced by British Columbia’s scaling system caused by the widespread devastation inflicted by the beetle.

²¹ Stmt. of Case ¶ 2.

24. Having provided the context for the dispute, the Statement then moves on to Canada's arguments addressed to the U.S. Statement of Case. Part I explains that the United States has failed to meet its burden of showing circumvention by Canada of the SLA. Parts II.A and II.B address the United States' "inferential" and "actions" cases, while Part II.C provides a description of British Columbia's auction system and explains how winning auction bids capture the value of rights to harvest all grades of timber, including Grade 4. Finally, in Part III of the Argument, Canada addresses the flawed legal underpinnings and logic of the U.S. request for a remedy.

THE CONTEXT OF THE PRESENT DISPUTE

I. THE SOFTWOOD LUMBER AGREEMENT 2006

25. In British Columbia, the Province owns 95 percent of all forestlands. The Canadian Constitution confers on the provinces the responsibility for the management of forestry resources in the provinces and for timber sales from provincial Crown lands. The provinces exercise this responsibility by entering into tenure or other licensing arrangements with private companies that permit those companies to harvest standing timber on Crown lands. The private companies are obligated to pay for the timber pursuant to provincial timber pricing requirements and to assist in the management and renewal of Crown lands.

The SLA divides British Columbia into two regions, the Coast and the Interior.²² This arbitration concerns only the Interior Region of British Columbia.

26. In contrast, the United States disposed of the vast majority of its public forest lands for little or no remuneration over a hundred years ago. Today, state and federally owned forestlands constitute only a small part of productive forestlands in the United States. Approximately 70 percent of these forestlands are held privately.

27. This difference in how the United States and Canada manage their forests has been a source of friction between the two countries for over 25 years. The current dispute is the latest in a series in which the United States has claimed that Canada is subsidizing or benefitting its softwood lumber industry, either directly, by charging too little for the right to harvest standing timber, or indirectly, by taking actions that result in lumber producers paying too little for that right.

28. Although Canada has prevailed in all of these disputes,²³ the harm caused by the duty deposits collected during the pendency of the costly legal challenges, and the

²² SLA 2006 Art. XVII(2)(a) (Ex. R-1).

²³ The U.S. administering authorities for the Countervailing Duty (“CVD”) and Antidumping (“AD”) laws – the Department of Commerce (“Commerce”) and the International Trade Commission (“ITC”) – have responded to U.S. industry pressure by conducting four CVD investigations and one AD investigation since 1982.

New CVD and AD investigations were initiated by Commerce in 2001 at the request of the U.S. industry, immediately following expiration of the 1996 Softwood Lumber Agreement. They resulted in decisions from the ITC and Commerce that the Canadian industry was subsidized, softwood lumber was being dumped into the United States from Canada and that Canadian imports were posing a threat to U.S. industry. Canada

(Footnote continued on next page)

possibility of the U.S. Department of Commerce (“Commerce”) initiating new investigations, resulted in Canada entering into agreements with the United States in 1986, 1996 and the current SLA in 2006. This is the third dispute arising out of the 2006 SLA and the second in which the United States has alleged that Canada has circumvented the Agreement in breach of Article XVII.

29. The terms of the bargain struck in the SLA are straightforward. Canada agreed to limit exports of softwood lumber to the United States when the price of lumber is below U.S. \$355 per thousand board feet, through a combination of export quotas and taxes for certain Regions and export taxes alone for other Regions (referred to in the Agreement as Export Measures). In return, the United States agreed not to apply its trade laws against Canadian exports of softwood lumber for the duration of the Agreement. These commitments are set out in Articles V and VI. The United States also agreed to revoke the Countervailing and Antidumping Duty Orders that had been imposed by Commerce and returned the USD \$5 billion in cash deposits that had been collected from Canadian exporters. In addition, the Parties agreed that Canada would set aside USD \$1 billion of the

(Footnote continued from prior page)

appealed the conformity of these determinations with U.S. law to NAFTA binational panels and the U.S. Court of International Trade. Canada likewise appealed the conformity of these determinations with WTO rules under the dispute settlement procedures of the WTO. Canada prevailed in each of these appeals.

returned monies to be split among the U.S. industry, a binational industry council and certain “meritorious initiatives” in the United States.

30. To prevent these commitments from being circumvented, the Parties included Article XVII, in which they agreed not to take actions that would offset or reduce Canada’s commitment to impose Export Measures or undermine the U.S. commitment not to impose trade actions. Article XVII(1) establishes the base rule typical of anti-circumvention provisions – it prohibits a Party from taking actions to circumvent *other provisions* in the Agreement. Article XVII(1) provides:

Neither Party, including any public authority of a Party, shall take action to circumvent or offset the commitments under the SLA 2006, including any action having the effect of reducing or offsetting the Export Measures or undermining the commitments set forth in Article V.²⁴

31. As a threshold matter, Article XVII requires the United States to first demonstrate that: (1) the government complained against has enacted a measure or taken an action; (2) the action has provided a benefit; and (3) the benefit was provided to producers or exporters of Canadian softwood lumber products. The United States has failed to meet these threshold requirements.

32. Even if the United States had satisfied these threshold requirements, the text of Article XVII makes clear that there would be no violation of the Agreement if the alleged

²⁴ SLA 2006 Art. XVII(1) (Ex. R-1).

action falls within one of the broad, non-exclusive “grandfathering” or “safe harbour” provisions of Article XVII. Two of these provisions are particularly relevant to this dispute:

- Article XVII(2)(a) protects Canada’s right to continue to operate and manage the forest management and timber pricing systems that were in existence, and which the Parties necessarily took into account in determining their level of commitments, when the SLA entered into force on October 12, 2006. Article XVII(2)(a) also preserves Canada’s right to make modifications to those systems, provided that such modifications “maintain or improve the extent to which stumpage charges reflect market conditions, including prices and costs.”²⁵
- Article XVII(4) expressly grandfathers British Columbia’s MPS.

33. These grandfathering and safe harbour provisions embrace Canada’s management of its forests and protect these activities from allegations of circumvention regardless of whether they constitute grants or other benefits to the industry. Ensuring that the anti-circumvention provision could not be used by the United States to roll back existing forest management systems, timber pricing systems and industry support programs, or interfere with Canada’s flexibility to modify or implement certain new programs, was of paramount importance to Canada when it negotiated the SLA.

34. In its Statement of Case, the United States characterizes Article XVII(2) of the SLA as imposing a *per se* rule with “limited exceptions” contemplating “that any grant or other benefit provided by B.C. ... circumvents the SLA if the grant or other benefit is

²⁵ SLA 2006 Art. XVII(2)(a) (Ex. R-1).

provided to producers or exporters of Canadian softwood lumber.”²⁶ This characterization directly misstates the text, context, and history of the Agreement.

35. Far from being “limited,” the safe harbours and grandfathering provisions are broad exclusions from the scope of actions that can or should be challenged as alleged circumventions. The Parties, in Article XVII(2)(a), excluded from challenge forest management and timber pricing systems. This was done by the grandfathering of current systems and safe harbouring appropriate future modifications. The intended breadth of the safe harbours is shown by the unambiguous wording “without limitation” in the chapeau of Article XVII(2). The Parties also agreed that “{a} provincial timber pricing or forest management system includes, without limitation, the data, variables, and procedures it employs.”²⁷

36. The U.S. characterization of Article XVII(2) is plainly incorrect when viewed in context. Crown forestry is a massive enterprise in British Columbia, and throughout all of Canada. The Canadian provincial governments manage well over one million square kilometers of forest land. Forest-related ministries in Canada employ thousands of officials who take needed actions on a daily basis to determine how the provinces and forest stakeholders will use the forest, manage wildlife and environmental values, fight fires and set

²⁶ Stmt. of Case ¶ 17.

²⁷ SLA 2006 Art. XVII(2)(a) (Ex. R-1).

fire control policies, determine allowable harvest areas and techniques, plan roads and communications networks, and establish and revise timber sales policies and practices. Documentation of the actions of these officials consumes hundreds of thousands of pages a year of decisions, reports, plans, and transactional documentation. In particular, British Columbia has developed a complex, legislated, public regulatory regime for the administration of harvesting rights, pricing, silviculture, forest health, recreational values, manufacturing issues, forest practices, harvest levels and public and First Nations consultations.

37. It would be inappropriate and unworkable to subject the day-to-day operations and procedures encompassed under this large forestry responsibility to review and reporting under the SLA. British Columbia's right to make forest policy decisions concerning forest management and timber pricing systems and to make changes in a manner that are consistent with the Government's objectives of applying market principles to these systems, are protected.

38. In the interest of transparency, the Parties to the SLA also agreed to notification provisions, which are set out in Article XV. Article XV(14) requires Canada to notify the United States of any change to a timber pricing or forest management system that Canada believes is covered by certain of the safe harbours of Article XVII, together with an explanation of why it is covered.

II. BRITISH COLUMBIA'S GRANDFATHERED FOREST MANAGEMENT AND TIMBER PRICING SYSTEMS

39. British Columbia's forest management and timber pricing systems, the MPS, and the regimes governing the scaling and grading of logs, are grandfathered under the SLA. When the Parties concluded the Agreement, the United States agreed to accept the systems in place as of July 1, 2006 with all their unique characteristics. This section describes those systems as they existed on July 1, 2006 and as they continue to operate today. All components of these systems are grandfathered.

A. THE FOREST MANAGEMENT SYSTEM

40. British Columbia's Ministry of Forests, Lands and Natural Resources is responsible for the administration and management of some 60 million hectares of Crown-owned forests in B.C.²⁸ The Ministry establishes forest management policies, including the establishment of annual allowable harvest levels and environmental objectives and standards; administers tenure and pricing policies; consults with First Nations; and authorizes harvest and related activities. In support of these basic functions, the Ministry maintains extensive

²⁸The full name of the Ministry has changed over the years. From 1988 until 2005, it was called the Ministry of Forests. From 2005 to 2010, it was the Ministry of Forests and Range. From 2010 to 2011, it was the Ministry of Forests, Mines and Lands. Since March 14, 2011, the name of the Ministry has been the Ministry of Forests, Lands and Natural Resources.

forest inventory data, conducts relevant forest research, monitors forest health, suppresses forest fires, and ensures compliance and enforcement of forestry regulatory requirements.²⁹

41. British Columbia awards long term tenures (similar to leases) to private forest companies, which provide these companies the right to harvest timber. Tenure holders are charged a fee, known as “stumpage,” to reflect the market value of the timber they harvest under these arrangements. At the same time, British Columbia requires these tenure holders to perform at their own expense a number of important forest management functions, including forest planning, road development and maintenance, and post-harvest silviculture (forest regeneration).³⁰

42. In addition to the long-term tenure arrangements, the government sells about twenty percent of the annual harvest through competitive timber auctions of short-term harvesting rights. British Columbia Timber Sales (“BCTS”), an arm of the Ministry, develops the timber for sale, administers the competitive timber auctions, and carries out the same post-harvest silviculture activities undertaken by long-term tenure holders on tenure lands as mentioned above. These competitive timber auctions provide the underpinnings of the stumpage pricing system.

²⁹ Witness Statement of James Snetsinger (hereinafter “Snetsinger Stmt.”) ¶ 14 (Ex. R-7); Witness Statement of Dana Hayden (hereinafter “Hayden Stmt.”) ¶ 11 (Ex. R-6).

³⁰ Snetsinger Stmt. ¶¶ 16-17 (Ex. R-7); Hayden Stmt. ¶ 14 (Ex. R-6).

43. Dana Hayden, B.C.'s former Deputy Minister of Forests and Range, now Deputy Minister with the Ministry of Jobs, Tourism and Innovation, explains in her Witness Statement that, subject to sustainability and environmental concerns, tenure holders make all commercial decisions respecting how much, what and when to harvest, as well as what products to produce from the timber and where and how to market those products.³¹ B.C. has, for decades, remained committed to this basic model, where the Crown owns the land and the forest, and the private sector, through tenure arrangements, manages the forest and pays stumpage when the timber is harvested.³² As Ms. Hayden explains, this basic model has proven very successful in meeting public expectations for forest management, enabling the development of a world-leading forest industry.³³

44. Deputy Minister Hayden further explains that, under the MPS system, the stumpage rates levied are market-determined, because they are tied to the results of the competitive timber auctions managed by BCTS.³⁴ This system allows the British Columbia government to receive market value for the timber that is harvested, and is consistent with the government's overall approach to economic policy, which has been to foster economic

³¹ Hayden Stmt. ¶ 14 (Ex. R-6).

³² *Id.* ¶¶ 7-8, 12.

³³ *Id.* ¶¶ 10-13.

³⁴ *Id.* ¶ 38.

development through sectoral and economy-wide measures to encourage innovation and promote market diversification.³⁵

B. THE TIMBER PRICING SYSTEM

45. The system by which B.C. prices timber harvested by tenure holders has two basic components that are relevant to this case. First, the system prescribes rules for weighing, measuring and classifying harvested logs. This is the log scaling and grading regime. Second, the MPS determines the prices – the stumpage – paid for the harvested logs. Both the log scaling and grading regime, and the MPS in place as of July 1, 2006 are grandfathered under the SLA. These grandfathered components of the B.C. timber pricing system are described below.

1. The Scaling and Log Grading Regime

46. The legal framework of the grandfathered timber scaling and grading regime in place as of July 1, 2006 is set forth in the B.C. Forest Act, the B.C. Timber Scaling Regulations, and the B.C. Scaling Manual. Scaling is the process for determining the volume or quantity of timber and classifying the quality of logs.³⁶ The latter part of the scaling process, classifying log quality, is referred to as log grading.

³⁵ *Id.* ¶¶ 19, 21.

³⁶ Forest Act, R.S.B.C. 1996, c 157, Part 6, § 93 (Ex. R-20).

47. Prior to July 2010, timber harvested in B.C. generally had to be scaled by a licensed scaler, subject to oversight by “check scalers” who work for the Ministry. For purposes relevant to this case, logs harvested in the B.C. Interior were scaled and graded using a weight scaling system. All harvested logs were weighed. Sample loads were then manually scaled and graded as described below. These loads provided a statistical sample of the volume and grade distribution that was then applied to other harvested loads with similar compositions based on weight. The discussion below focuses on the process by which logs from sample loads were manually scaled and graded under the grandfathered regime.

a. The Elements of Scaling

48. Timber scaling is not a process unique to the British Columbia Interior. There are many different systems for log scaling around the world, but most fall into one of two categories: volumetric (or “cubic scale”) and product output (or “log rules”).³⁷ As one of the world’s leading experts on log scaling explains, “most of the world utilizes cubic measure, which measures all the wood fibre in cubic volumetric units and makes no assumption as to product output.”³⁸ By contrast, most jurisdictions in the United States apply some form of “product output rule,” “which attempt {s} to predict the volume of

³⁷ M.A. Fonseca, “The Measurement of Roundwood: Methodologies and Conversion Ratios,” at 6 (2005) (Ex. R-119).

³⁸ *Id.*

lumber that a log will produce.”³⁹ Even product output rules, however, generally fail to yield accurate predictions of lumber output:

At best, a log rule can only approximate salable manufactured volume because of constant changes in markets, machinery, manufacturing practices, and even the varying skill of individual sawyers. Thus a log rule is an arbitrary measure. Its application will not be varied according to the mill in which the logs are sawed. The scaled volume must be independent of variations in manufacture.⁴⁰

49. The B.C. Interior log scaling system as it existed as of July 1, 2006 – and as it has existed since 1946 – is an example of a volumetric system that measures log volume but does not attempt or purport to predict product output.⁴¹

50. Scaling (and grading) logs under the B.C. scaling rules is an exercise in measurement and geometry. A scaler measures and records the length of a log and its diameter at each end.⁴² With those measurements, the scaler follows Smalian’s formula, a geometric formula for calculating the volume of a tapered cylinder, to determine the log’s

³⁹ *Id.* at 47-48.

⁴⁰ Northwest Log Rules Advisory Group, Northwest Log Rules Eastside and Westside Log Scaling Handbook (Jan. 1, 2011 Edition), at 5 (R-122).

⁴¹ Witness Statement of James D. Crover (hereinafter “Crover Stmt.”) ¶ 15 (Ex. R-3); *see also* Scaling Manual (June 30, 2006), §1.2.1 at 1-4 (describing introduction of British Columbia Cubic Scale in 1946 and noting that “in contrast to the British Columbia Log Scale, which attempted to estimate the amount of lumber that could be produced from a log, the cubic scale ... only attempted to estimate the volume of the log suitable for the manufacture of lumber.”) (Ex. R-19).

⁴² Scaling Regulation, B.C. Reg. 446/94, § 6 (Ex. R-22).

gross volume in cubic metres.⁴³ The below figure, taken from the Scaling Manual in place as of July 1, 2006, illustrates two ways to visualize the geometry of log volume.

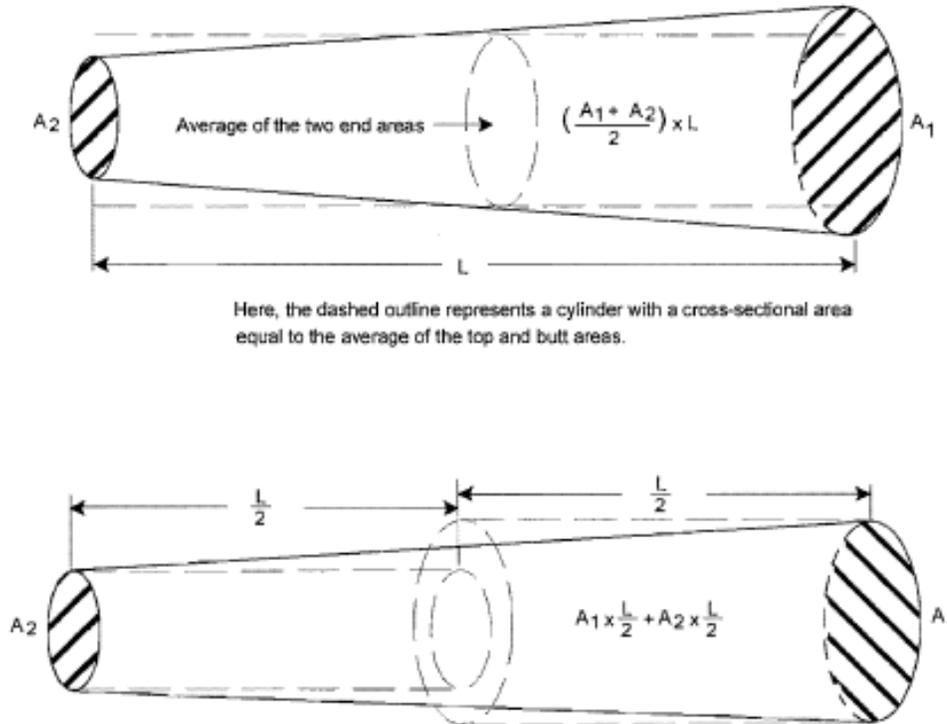


Figure 1: Geometry of log volume, Scaling Manual (June 30, 2006), § 5.2.1, Figure 5.3 at 5-8

51. As the Scaling Manual explains, “if all logs were smooth, round, and sound, scaling would be simple. Because they are not, it is necessary for the scaler to find the amount of volume lost from various defects.”⁴⁴ Defects that reduce the amount of wood

⁴³ Forest Act, R.S.B.C. 1996, c 157, Part 6, § 96 (Ex. R-20); Crover Stmt. ¶¶ 27-28 (Ex. R-3); Scaling Manual (June 30, 2006), § 5.2 at 5-5 (Ex. R-19).

⁴⁴ Scaling Manual (June 30, 2006), § 4 at 4-1 (Ex. R-19).

fibre that will be subject to stumpage⁴⁵ are measured, their volume is calculated, and that volume is deducted from the log's gross volume to arrive at a net volume. The Scaling Manual devotes more than 100 pages to providing guidance on measuring and applying the rules of geometry to the many variations in shapes of logs and types of defect.⁴⁶ The objective of the scaler following this guidance and applying the rules is to determine the volume of sound fibre (that is, without rot, char, holes or voids) in each log.

b. The Elements of Grading

52. Log grading classifies logs based on their physical characteristics and “is used to make the volume information of the scale more meaningful and useful to dealers in timber, and to managers of the forest resource.”⁴⁷ Under the grandfathered system, the Scaling Regulation sets forth the general definitions of Interior log grades, which vary based on species, while the Scaling Manual contains detailed rules and procedures for assessing grade. The United States’ case concerns the distinction between Grade 2 and Grade 4 in lodgepole pine under rules in effect since 2006.

53. For lodgepole pine, a Grade 4 log is defined as one that does not meet the requirements for Grade 2. The requirements for Grade 2 are: “A log 2.5 m or more in

⁴⁵ The Scaling Regulation requires that the volume of a log with defects in the form of “rotted, holed or charred wood” be deducted from the gross volume. Scaling Regulation, B.C. Reg. 446/94, § 6(h) (Ex. R-22).

⁴⁶ See e.g., Scaling Manual (June 30, 2006), § 5 at 5-1 to 5-120; § 6 at 6-1 to 6-112 (Ex. R-19).

⁴⁷ Scaling Manual (June 30, 2006), Ch. 6 at 6-1 (Ex. R-19).

length and 5 cm or more in radius..., where: ... at least 50 percent of the gross scale can be manufactured into lumber, and ... at least 50 percent of the lumber will be merchantable.”⁴⁸

The United States characterizes this test – the “50/50 rule” – as the heart of its case.⁴⁹

54. The 50/50 test as implemented by the Scaling Manual provides the basis for determining whether a lodgepole pine log is Grade 2 or Grade 4. As explained in the witness statement of James Crover, the senior B.C. official responsible for timber scaling policy from 2002 through 2009, however, the scaling system does not simply direct scalers to apply the 50/50 test without any guidance. As with the definitions, rules, and procedures that scalers follow to determine the volume of a log, there are definitions, rules, and procedures for scalers to follow to determine the volume of a log available for the manufacture of lumber.

55. First, the grandfathered Scaling Regime defines “lumber” as a board “2.5 m long, free of rot and fractures.”⁵⁰ Under the 50/50 test, therefore, a log segment that is shorter than 2.5 metres or that contains a crack or check that would result in a fracture in a board cut from the log is, by definition, not available for the manufacture of “lumber.” The procedures set forth in the Scaling Manual for the application of the 50/50 test adhere to

⁴⁸ Scaling Regulation, B.C. Reg. 446/94, § 4-Schedule of Interior Timber Grades (Ex. R-22); *see also* Scaling Manual (June 30, 2006), § 6.6.3.4.1 at 6-110 (Ex. R-19).

⁴⁹ Stmt. of Case ¶ 40 (“The heart of these reforms – and of this case – is the ‘50/50 rule’”).

⁵⁰ Scaling Manual (June 30, 2006), at G-8 (Glossary of Terms) (Ex. R-19).

this definition and treat log volume containing fractures as unavailable to manufacture lumber.⁵¹ A sawmill is free to produce boards that contain fractures from log segments containing checks and may sell those boards as lumber, but that is immaterial to the log's grade, which must be based on its physical characteristics.

56. Second, the percentage of a log's volume that can theoretically be used to manufacture lumber is not the same thing as the percentage of a log's volume that is actually converted into lumber. For one thing, it is geometrically impossible to use 100 percent of the volume of a cylinder to make rectangular objects. A lumber mill may choose, on any given day, to maximize lumber volume through the production of a large quantity of lower-quality lumber containing fractures, or to focus on the production of a smaller quantity of higher-quality lumber cut to avoid such fractures. The same log might be used for either purpose, but the volume of lumber recovered from that log would be different, for no reason other than the choice made by the mill. A scaler might, for example, properly determine that a log has 45 percent fracture-free volume available to produce lumber (qualifying it only for Grade 4), while the mill processing that log could legitimately utilize 55 percent of the log volume, if the mill is prepared to use some of the fractured volume to produce lower-quality lumber. Such a result would be consistent with the grandfathered Scaling Regime, which does not link the scaling of individual logs to the end use of those

⁵¹ Crover Stmt. ¶ 43 (Ex. R-3); Scaling Manual (June 30, 2006) § 6.3.1.1 at 6-7 (Ex. R-19).

logs nor to the volume of lumber produced. The B.C. log Scaling Regime was not designed to be, and has never been, predicative of lumber recovery. Scalers cannot know what will happen to a log after it is scaled. The scaler does not and cannot predict what kind or how much lumber will ultimately be produced from that log.⁵² To the contrary, the Scaling Manual directs that grading be “{d}one in strict compliance with the grading rules,” and expressly recognizes that grading “is entirely independent of the marketing and/or processing practices of the purchaser,” and that “{i}t is up to the manufacturer to get the best and most product out of the available volume.”⁵³

57. Third, the grandfathered procedures for determining the volume available to manufacture fracture-free lumber include assumptions about the volume of a log lost to defect that are not calibrated to the operation of particular mills, and are not intended to be. For instance, the grandfathered rules treat both the area of a defect and a standard “trim allowance” around the defect as unavailable for the manufacture of lumber. The standard trim allowance has been set at 2 cm (1 rad)⁵⁴ on each side of a defect since 1995.⁵⁵

⁵² This fact is not unique to the B.C. system. Indeed, the prevailing log scaling and grading system in the United States likewise is not predictive of actual lumber output.

⁵³ Scaling Manual (May 1, 2007), § 8.3 at 8-4 (C-50).

⁵⁴ A “rad” is a radius class unit (equal to 2 cm) and is used for measuring diameters, widths and thicknesses. Scaling Manual (June 30, 2006), § 5.1.1 at 5-2 (Ex. R-19).

⁵⁵ See Scaling Manual (June 1, 1995), § 6.3.3.5 at 6-8 (stating that “{t}rim allowance is included in the grade deduction and refers to the sound wood surrounding rot and other defects lost to lumber recovery because the sawyer must square out around defects (normally 2 cm (1 rad) on each side of the defect).”) (Ex. R-21).

Technologically advanced sawmills may be able to trim around defects more closely, and thus utilize more volume, than the rules assume, but the grandfathered system does not seek to account for the capabilities of individual mills. Similarly, the scaling rules treat as unavailable any segment of a log where two or more defects are positioned such that there is less than 10 cm of fibre between them.⁵⁶ A mill might be able to use such a segment to manufacture boards, but the grandfathered rules focus on objective characteristics of logs, not on the processes of the mills that saw them into lumber.

58. Since at least 1991, British Columbia has collected annual lumber recovery data from sawmills and has published the data in aggregate form. The lumber recovery data that the Ministry collects has never been used for developing or administering the scaling system.⁵⁷ There has never been any effort to calibrate log grades to real-world lumber recovery, and any such effort would be inconsistent with the non-predictive design of the scaling system as well as a practical impossibility.

59. Fourth, scalers determine the volume available to manufacture lumber by following the specific rules set out in the Scaling Manual. Although the grandfathered rules and procedures generally implement the 50/50 test, a scaler can accurately grade a log by

⁵⁶ Scaling Manual (June 30, 2006), § 6.4.2.3 at 6-21; § 6.6.6.4.2 at 6-110 (Ex. R-19).

⁵⁷ Crover Stmt. ¶ 69 (Ex. R-3).

simply measuring characteristics of the log and performing the calculations in the Scaling Manual, without ever specifically referencing the 50/50 test.

60. Finally, it is important to understand in context the fact that Grade 4 logs are referred to as “lumber reject” and stumpage for such logs is assessed at C \$0.25 per cubic metre. The term “lumber reject” applied to Grade 4 logs should not be interpreted to mean that Grade 4 logs cannot be used to manufacture lumber.⁵⁸ Indeed, under the 50/50 test, a Grade 4 “lumber reject” log could hypothetically have 100 percent of its volume available to manufacture lumber if less than 50 percent of that lumber would meet the definition of merchantable.⁵⁹ At the same time, a log could be classified as Grade 2 even if it had only 50 percent of its volume available to manufacture lumber and only fifty percent of that lumber would be merchantable. Thus, a log properly classified as Grade 4 could have as much as 49 percent of its volume available to manufacture merchantable lumber and be termed a “lumber reject,” while a properly classified Grade 2 log could have as little as 25 percent of its volume available to manufacture merchantable lumber and be termed a “sawlog.” These extremes of the two log grades, while perhaps improbable, illustrate that there is no reason

⁵⁸ Crover Stmt. ¶ 40 (Ex. R-3).

⁵⁹ The Scaling Manual defines “merchantable lumber” as “good, strong, general purpose lumber graded as better than utility or number 3, and not less than 2.5 m long (this is assessed on the basis of knots and twist).” Scaling Manual (June 30, 2006), Glossary of Terms at G-8 (Ex. R-19). Although “merchantable” is defined in terms of lumber grades, the Scaling Manual restricts the criteria for merchantability to knots and twists, which scalers can assess on a harvested log, rather than requiring them to apply the more complex lumber grading rules for end products that may or may not be produced from the log.

to assume that a Grade 4 “lumber reject” log will necessarily produce less or lower value lumber than a Grade 2 “sawlog.” Certainly, one cannot assume that significantly more lumber would be recovered from a log that just barely passes the 50/50 test (*i.e.*, a Grade 2 log) than would be recovered from a log that just barely fails (*i.e.*, a Grade 4 log).

61. “Lumber reject” logs have been assessed the minimum C \$0.25 stumpage per cubic metre since long before the SLA came into force, and sawmills have always been free to process those logs into lumber. Whether sawmills will choose to process Grade 4 logs into lumber depends on numerous variables – including mill technology, market conditions, and availability of alternative timber supply – for which the grandfathered log grades could not possibly account.

2. The Market Pricing System

62. Under the MPS, British Columbia timber prices (stumpage rates) are market-based. Specifically, the stumpage paid for timber harvested under long-term tenures is tied to the prices bid for similar timber in competitive timber auctions. The Statement of Case does not challenge the MPS system, perhaps recognizing that it is explicitly grandfathered in the SLA. This Statement of Defence will therefore pause to describe the MPS system only long enough to explain its place in British Columbia’s forest management system.

63. BCTS develops timber stands to a “ready to harvest” state and then auctions these stands to the highest bidder. The auctions are open and competitive, with awards based solely on the highest bid. Prospective bidders are provided with extensive information

on the timber and have the opportunity to examine the timber for themselves. BCTS auctions off roughly 20 percent of the annual Interior harvest; the stands auctioned are representative of the mix of stands harvested by long-term tenure holders. Following harvest, the rights revert to BCTS, which assumes responsibility for silviculture (forest regeneration) and prepares the site for future harvest.⁶⁰

64. The winning bids on these auction sales are then used to set the stumpage rates on the timber harvested by long term tenure holders. Such “transaction evidence” systems are common. For example, many metals and other industrial commodities sold under contract are priced with reference to commodity auction prices, as is done on the London Metal Exchange.⁶¹

65. The MPS employs a two step procedure for determining stumpage rates. In the first step, the Average Market Price (“AMP”) is determined based on the estimated competitive auction value of the stands of timber proposed for harvest. The winning bids on BCTS sales are used to establish the value of similar timber harvested by licensees. However, because no two timber stands are exactly alike, MPS uses statistical methods to estimate the value of the licensees’ timber. It does this by analyzing how the various attributes of the auctioned timber (species, location, terrain, market conditions, etc.) affect

⁶⁰ See, e.g., B.C. Timber Sales, Annual Service Plan Report 2006/2007 at 1-3 (Ex. R-123).

⁶¹ Joint Expert Report of Susan Athey and Peter Cramton (hereinafter “Athey & Cramton Report”) ¶¶ 18-20 (Ex. R-8).

the BCTS winning bids, and applying the results to the licensee's timber harvest. This methodology calculates what the timber would have been sold for had it been sold by BCTS. The resulting values are then adjusted to take into account the costs borne by long-term licensees for planning, road development and maintenance and post-harvest silviculture.⁶² The overall market value of each stand is then calculated by incorporating the low-grade component of the stand nominally valued at 25 cents per cubic metre. The volume weighted average of these stand values is the AMP.

66. In the second step, individual appraisals of these stands proposed for harvest are conducted based primarily on estimates of the revenues and costs of harvesting the timber and processing the logs in the sawmills. The relative values of the different stands are then aligned to the AMP. This means that any appraisal factor tending to lower stumpage rates on one or more stands or types of stands will be exactly offset by increases in rates for other stands. The resulting stumpage rates are applied as the timber is harvested, scaled and graded. By tying the AMP to the results of a large and representative sample of competitive timber auctions, British Columbia has ensured that its stumpage charges accurately reflect

⁶² This adjustment is referred to as a "tenure obligation adjustment" or TOA. The TOA is initially calculated as an amount per cubic meter of total volume in the stand; this amount is then divided by the sawlog share of total stand volume to obtain the TOA in terms of cubic meters of sawlogs. This is so that the entire TOA can be applied to the sawlog volume when determining the sawlog stumpage rate. See "Interior Market Pricing System, Tenure Obligation Adjustments," B.C. Ministry of Forests and Range (June 5, 2006), CAN-028620-35 (Ex. R-126).

the market value of the timber harvest.⁶³ The second step involves a separate appraisal process for calculating relative stand values which are then exactly aligned to the AMP. This second step affects individual stand stumpage rates, but does not affect the average stumpage rate or total government stumpage revenue.

67. The volume and grade of Crown timber is determined by a post-harvest scale of the resulting logs. In the current B.C. scaling system there are two grades of “sawlogs,” Grade 1 and Grade 2; and two grades of “low grade” logs, Grade 4 and Grade 6. “Low grade” logs are priced at the rate of C \$0.25 per cubic metre.⁶⁴

68. The winning bidder at a BCTS auction acquires the harvest rights to all of the timber specified in the sale, including both the sawlog timber and the low grade timber (as determined by the scaling that takes place after harvest). The bidders specify their bids in the form of so many dollars per cubic metre of sawlog. The highest bid is awarded the harvest rights to the entire stand. Because the right to harvest encompasses the entire stand, the bid price for the sawlogs reflects the market value of the entire stand – both the sawlogs and low-grade logs.⁶⁵

⁶³ Hayden Stmt. ¶ 38 (Ex. R-6); *see* B.C. Timber Sales Annual Service Plan Report 2006/2007 at 9-10 (Ex. R-123).

⁶⁴ Pricing at C \$0.25 for low grade logs was first introduced in the Interior in 1989 to avoid the need for a separate appraisal system that would have to be run in parallel with the system for saw logs.

⁶⁵ Athey & Cramton Report ¶¶ 16, 30-37 (Ex. R-8).

69. Stumpage payments by long-term tenure holders are structured in the same way, using the same log grades and same scaling and grading system as for BCTS. As with BCTS, the overall stumpage charge reflects the market value of all of the timber.

70. The MPS system came into effect on July 1, 2006. When Canada negotiated the SLA, it specifically sought and obtained agreement by the United States to have MPS expressly grandfathered under Article XVII(2)(a) and (4). On July 1, 2010, British Columbia began pricing the most heavily impacted dead pine stands on a lump sum basis, thereby eliminating the distinction between sawlog and low grade (Grade 4) for these stands. This change was made to reduce costs and improve efficiencies and thereby to encourage the utilization of the poorest quality damaged pine; it was not expected to affect revenue.⁶⁶

III. THE MOUNTAIN PINE BEETLE EPIDEMIC

A. BRITISH COLUMBIA'S EXPERIENCE

1. The Mountain Pine Beetle

71. The Mountain Pine Beetle ("MPB") is an aggressive bark beetle about the size of a grain of rice that has long been endemic to the pine forests of western North America.

⁶⁶ Hayden Stmt. ¶¶ 47-48 (Ex. R-6); Athey & Cramton Report ¶¶ 76-78 (Ex. R-8); *see also* "Interior Market Pricing System" at 1, British Columbia Ministry of Forests and Range (June 1, 2006) ("The central concept underlying the MPS is that auctions of standing timber establish the market value of timber, and those market values can then be used to determine the stumpage price for timber harvested under long-term tenures.") (Ex. R-140).

The MPB has a one-year life cycle that begins with adult beetles emerging in late July to early August from the host trees in which they hatched. The beetles fly to new host trees, bore into the bark, and attempt to overcome the trees' natural defences by attracting more beetles to overwhelm the tree. The beetles lay eggs in the outer layer of the tree just under the bark. The larvae hatch in late summer, feed on the tree's outer layer, and emerge as adults the next summer to begin the cycle anew. The photograph below shows the exterior of a tree attacked by the MPB and the galleries tunneled under the bark in which the female beetles lay their eggs.⁶⁷

⁶⁷ Witness Statement of Tim Ebata (hereinafter "Ebata Stmt.") ¶ 14 (Ex. R-4).

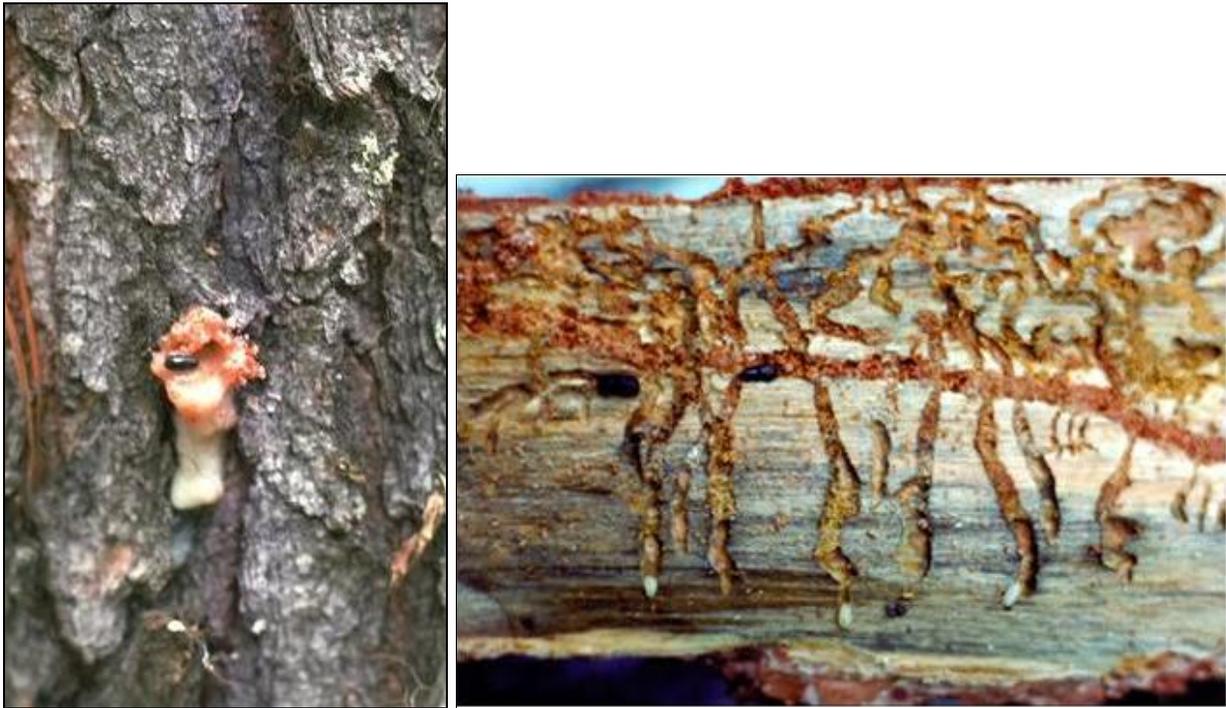


Figure 2: Tree successfully “pitching out” adult beetles with resin, Ebata Stmt. Fig. 3 (Ex. R-4)

Figure 3: MPB egg and larval galleries, Ebata Stmt. Fig. 4 (Ex. R-4)

72. The MPB has historically been held in check by extremely cold temperatures. In the fall and spring, when beetle larvae are active and most vulnerable, temperatures below minus 25°C will kill most beetles and delay the maturity and emergence of any survivors. During winter, when the larvae are at their most resistant to cold, high mortality does not occur until temperatures dip to minus 40°C or below. Although control and containment efforts have some effect, once an outbreak occurs it typically spreads until adequate host trees have been depleted or a severe cold spell reduces the MPB population.⁶⁸ [

⁶⁸ Ebata Stmt. ¶ 15 (Ex. R-4).

]⁶⁹

73. The beetle releases a rapidly spreading fungus into the tree that stains the sapwood blue and blocks the host tree's ability to conduct water from its roots to its foliage. Starved of water by the effects of the fungus and the effect of the beetles' tunneling on the trees' ability to circulate fluid, colonized trees die quickly after attack.⁷⁰

2. The Mountain Pine Beetle's Effects on Timber

74. The United States correctly states that "the blue stain caused by the beetle has no effect on wood's strength properties."⁷¹ What the United States chooses to disregard, however, is that the combined forces of the beetle and the fungus kill the tree, and the death

⁶⁹ [] (Ex. R-2).

⁷⁰ Report of Katherine J. Lewis (hereinafter "Lewis Report") ¶ 7 (Ex. R-10); Ebata Stmt. ¶ 14 (Ex. R-4).

⁷¹ Stmt. of Case ¶ 29.

of the tree, over time, has a severely adverse effect on the quality of the wood. The blue stain also affects the marketability of high-value “appearance” grades of lumber.⁷²

75. Dr. Katherine Lewis, Professor and Chair of the Ecosystem Science and Management Program at the University of Northern British Columbia, explains in her report that neither the beetle nor the blue stain fungus *directly and immediately* harms the integrity of the host tree’s wood fibre.⁷³ The beetle’s boring into the bark, the construction of egg galleries, and the pervasive feeding on the tree’s outer layer by beetle larvae often result in light scarring in a tree’s sapwood, but cause no significant damage to the wood fibre. Similarly, the blue stain fungus, which the beetle introduces into the tree, has little immediate effect on the strength properties of the wood. Rather, the blue stain fungus causes a discoloration of the wood (hence its name), blocks the tree’s circulation, and significantly increases the permeability to moisture of the wood fibre.⁷⁴

76. The harm to the integrity of the host tree’s wood fibre occurs *indirectly and over time* as a result of the death of the tree. As Dr. Lewis explains, once a tree has been killed by the joint-efforts of the beetle and the blue stain fungus it carries, the tree begins to dry out. A living lodgepole pine tree typically has a moisture content between 85 percent and 165 percent, meaning that the mass of the water in a living lodgepole pine tree is equal to

⁷² Lewis Report ¶ 47 (Ex. R-10); [] (Ex. R-2).

⁷³ Lewis Report ¶¶ 8, 47 (Ex. R-10).

⁷⁴ Lewis Report ¶ 49 (Ex. R-10).

between 85 percent and 165 percent of the mass of the tree's dry wood.⁷⁵ Once a tree has died, its moisture content declines. As moisture leaves wood cells, the cells shrink. The shrinkage causes stress, which eventually overcomes the strength of the wood tissue and causes it to fracture along its vertical grain, releasing pressure and leaving longitudinal cracks called "checks" in the wood.⁷⁶ It is these fractures in the wood that primarily affect the ability to saw lumber and make other products from MPB-killed trees.⁷⁷

77. As MPB-killed pine trees remain standing, fluctuations in ambient moisture cause the wood to pass through repeated cycles of swelling when it is wet and contracting when it is dry.⁷⁸ Those cycles cause additional stress on the wood. Repeated stress of this kind can ultimately result in loosening or lost bark and further splitting along existing checks. The witness statement of [

] ⁷⁹

⁷⁵ Lewis Report ¶ 53 (Ex. R-10). Moisture content is defined as "the mass of water compared to the mass of the dry wood" in which it is contained. Oliveira Report ¶ 47 (Ex. R-11).

⁷⁶ Lewis Report ¶ 64 (Ex. R-10); Oliveira Report ¶¶ 11, 57 (Ex. R-11).

⁷⁷ Lewis Report ¶¶ 12, 64 (Ex. R-10).

⁷⁸ Lewis Report ¶ 83 (Ex. R-10).

⁷⁹ [] (Ex. R-2).



Figure 4:: Checked MPB-killed logs, [] (Ex. R-2)

Similar checks can be seen in several of the logs in Figure 5, which also shows shallow radial checking around the tree's circumference.⁸⁰

⁸⁰ Lewis Report ¶ 56 (Ex. R-10); Oliveira Report ¶ 57 (Ex. R-11).



Figure 5: Canfor's Isle Pierre Mill near Prince George, July 15, 2010

78. The initial loss of moisture takes time, with the rate of drying varying with site conditions and climate.⁸¹ Trees that have been attacked and killed in the summer typically retain enough moisture through the fall, winter, and spring that their needles remain green until late spring or early summer following attack.⁸² This stage, which can last up to a year after the tree has been killed, is called “**Green Attack**.”⁸³ Drying during that first year after death is moderate, and checking is uncommon.⁸⁴ Below is a photograph of a [

⁸¹ Lewis Report ¶¶ 81, 86 (Ex. R-10).

⁸² *Id.* ¶¶ 7, 21-22.

⁸³ Ebata Stmt. ¶ 18 (Ex. R-4).

⁸⁴ Lewis Report ¶ 9 and App. 3 at 140 (Ex. R-10).

] ⁸⁵

Figure 6: Cross section of a log harvested during the Green Attack, [] (Ex. R-2)

79. By the middle of July, most trees killed during the preceding summer will show visible signs of moisture loss, which will cause the needles to turn from green to bright red.⁸⁶ This is referred to as “**Red Stage**.”⁸⁷ The appearance of these bright red needles is typically the easiest way to track the geographic progress of MPB attack, because the color is

⁸⁵ [] (Ex. R-2).

⁸⁶ Ebata Stmt. ¶ 19 (Ex. R-4).

⁸⁷ Lewis Report ¶ 30 (Ex. R-10); By the time a tree’s needles turn red, the tree is dead and no longer under active MPB attack. Although the term “red attack” is sometimes used to describe this stage, the term “red stage” is more accurate because it describes trees that have already been attacked and killed and now have red needles.

visible from aircraft and in satellite images.⁸⁸ How long trees remain in the Red Stage depends on a number of variables, including ambient moisture levels, foliage density, and weather conditions. Dead pine trees typically retain their red needles for at least one full year (*i.e.*, until two years after death), but it is common for trees to remain in the Red Stage for two years (*i.e.*, until three years after death).⁸⁹



Figure 7: Red Stage landscape. Bonaparte Plateau (North of Kamloops, British Columbia), Ebata Stmt. Fig. 7 (Ex. R-4)

⁸⁸ Ebata Stmt. ¶ 19 (Ex. R-4).

⁸⁹ *Id.* ¶ 20.

80. Researchers have distinguished early Red Stage from late Red Stage and have found moderate drying and little checking at the early stage and more substantial drying and increased likelihood of checking at the late stage.⁹⁰ Figure 8 shows a tree in the early Red Stage and a cross section taken from that tree, and Figure 9 shows a tree in late Red Stage and a cross section taken from that tree, both at the height of five metres.⁹¹ Checks are marked on both cookies by short black lines perpendicular to the checks.

⁹⁰ Lewis Report ¶ 34 (Ex. R-10).

⁹¹ Ebata Stmt. ¶ 19 (Ex. R-4); Photos of Early Stage Tree and Cross Section (Ex. R-42); Photos of Late Red Stage Tree and Cross Section (Ex. R-43).



Figure 8: Early Red Stage tree and cross-section taken at 5m, Quesnel, June 2006 (Ex. R-42)



Figure 9: Late Red Stage tree and cross-section taken at 5m, Quesnel, June 2006 (Ex. R-43)

81. By the time the tree has been dead for three years, it will usually have dried to the point that it can no longer retain its needles. Dead pine trees without foliage appear grey

in color, and this stage is thus called “**Grey Stage.**”⁹² Checking is common in Grey Stage trees, and becomes increasingly common and severe as the trees stand dead, exposed to the elements and repeated cycles of moisture absorption and loss. Figure 10 shows a Grey Stage forest from the air. Figure 11 shows a photograph of a Grey Stage tree and a cross section taken from it.⁹³ Checks are, again, marked with short black lines perpendicular to the check.



Figure 10: Grey Stage landscape. Chilcotin Forest District, August 2008, Ebata Stmt. Fig. 9 (Ex. R-4)

⁹² Ebata Stmt. ¶ 20 (Ex. R-4); Photos of Grey Stage Tree and Cross Section (Ex. R-44).

⁹³ *Id.*



Figure 11: Grey Stage tree and cross-section taken at 5m, Quesnel, July 2006, (Ex. R-44)

82. In this arbitration, the United States asserts that “the activity of the beetle does not affect the quality or structural integrity of the wood, {so} lumber from MPB timber

can be manufactured and put to the same uses and purposes as lumber from timber unaffected by the beetle.”⁹⁴ Likewise, the United States declares that “while the mountain pine beetle does eventually have an adverse effect on logs, the primary effect initially is *not* to diminish the *quality* of even grey-stage timber for purposes of manufacturing merchantable lumber.”⁹⁵ The United States Forest Service, however, has taken a different position: “beetle-killed timber quickly loses its commercial value for saw timber due to rot and checking (*i.e.*, cracks). This typically occurs within 3-5 years following infestation.”⁹⁶ Consistent with this understanding, the U.S. Forest Service has been willing to waive stumpage fees and actually pay as much as \$3,500 per acre to have beetle-killed timber removed from forests under its jurisdiction.⁹⁷

83. The fact is that the condition of Grey Stage trees only worsens as the tree stands.⁹⁸ Eventually, most MPB-killed trees will fall. The length of time that an MPB-killed tree will remain standing depends on many factors including soil conditions, ambient moisture, presence of other wood boring insects (*e.g.*, carpenter ants), decay fungi, and exposure to wind.⁹⁹ Once a tree falls, it becomes vulnerable to severe rotting and decay that

⁹⁴ Stmt. of Case ¶ 30 (citing, *e.g.*, C-92, a promotional brochure for a product called “Denim Pine”).

⁹⁵ *Id.* ¶ 51.

⁹⁶ U.S. Forest Service, Bark Beetle Incident Implementation Plan, at 7 (Aug. 29, 2007) (Ex. R-124).

⁹⁷ Kalt Report ¶ 48 (Ex. R-9).

⁹⁸ Ebata Stmt. ¶ 21 (Ex. R-4).

⁹⁹ *Id.*

compromise the wood's structural integrity and render the timber unusable for manufacturing conventional wood products (*e.g.*, lumber, pulp).¹⁰⁰

84. The development of cracks (or checks) in MPB-killed trees generally corresponds with the number of years that the tree has been dead (and thus attack stage). In her report, Dr. Lewis describes a number of studies – including her own – that have investigated this relationship and concludes that years post-mortality is one of the most significant predictor variables for the prevalence, number, and depth of checks.¹⁰¹ The table below summarizes Dr. Lewis's conclusions concerning the physical characteristics over time of timber killed by the MPB.

¹⁰⁰ See, *e.g.*, Lewis Report ¶¶ 11, 72 (Ex. R-10); see also U.S. Forest Service, Bark Beetle Incident Implementation Plan, at 9 (“Once trees fall to the ground, deterioration is rapid and any economic value is reduced or lost.”) (Ex. R-124).

¹⁰¹ The other factor is tree size. Lewis Report ¶¶ 56-63 (Ex. R-10)

Years Since Death	Attack Stage	Moisture Content	Log Characteristics
Not attacked	Not attacked	85-165%	Green wood
0-1	Green Attack	40-80%	Visible blue stain and appearance of beetle galleries under bark. Wood is otherwise comparable to live, green timber.
1-2	Red Stage	20-30%	Checks begin to appear in wood as trees dry.
2-6	Grey Stage	15-30%	Checks appear in most trees and are severe in many. The proportion of trees with checks and the depth of checks increase gradually over time.
7+	Grey Stage	15-30%	Virtually all logs exhibit numerous deep checks. Bark loosens or sloughs off. Small surface checks are likely to have developed, particularly where bark is missing. Trees become increasingly likely to fall.

Figure 12: Summary of Dr. Lewis’ conclusions concerning the physical characteristics over time of timber killed by the MPB¹⁰²

3. The Current Outbreak

85. The current North American MPB outbreak is the most severe and devastating bark beetle infestation ever recorded, anywhere in the world. It is unprecedented in terms of its scope, range, magnitude, severity, intensity, and economic impact, and B.C. has felt the brunt of its effects. Since the mid-1980’s, lodgepole pine has

¹⁰² Lewis Report ¶¶ 8, 53, 54, 55-63, 80-86 (Ex. R-10).

contributed to a larger share of B.C. Interior lumber production than any other tree species¹⁰³ and represents about 50 percent of B.C.'s timber harvesting landbase.¹⁰⁴

86. Until the current outbreak, the largest outbreak in recent British Columbia history was one that began in 1980, when an infestation appeared in the Chilcotin region of B.C. The beetle spread across the region, with the outbreak ultimately covering roughly 470,000 hectares in 1984, which was almost three times the total area harvested of all conifer species throughout British Columbia in the preceding year. The Chilcotin outbreak was ended by cold winter temperatures in 1984 and 1985.¹⁰⁵

87. []¹⁰⁶ At

the peak of that outbreak, pine trees covering an area of roughly 470,000 hectares were affected.¹⁰⁷ By comparison, during the current outbreak, the peak area covered by Red Stage

¹⁰³ Snetsinger Stmt. ¶ 11 (“{l}odgepole pine represents over one-third of the pre-infestation timber inventory in the Interior timber harvesting land base.”) (Ex. R-7).

¹⁰⁴ Lewis, K.J. and Thompson, R.D. 2011. Degradation of Wood in Standing Lodgepole Pine Killed by Mountain Pine Beetle. Wood and Fiber Science 43:130-142 (Lewis Report, App. 3 (Ex. R-10)).

¹⁰⁵ Ebata Stmt. ¶ 28 (Ex. R-4); [] (Ex. R-2).

¹⁰⁶ [] (Ex. R-2).

¹⁰⁷ Ebata Stmt. ¶ 28 (Ex. R-4).

pine trees *in a single year* was over 10,000,000 hectares.¹⁰⁸ Figure 13, below, shows the land area observed to be in Red Stage in each year from 1981 through 2010.¹⁰⁹

Total Area of B.C. (in Ha) Attacked by the MPB : 1981 – 2010

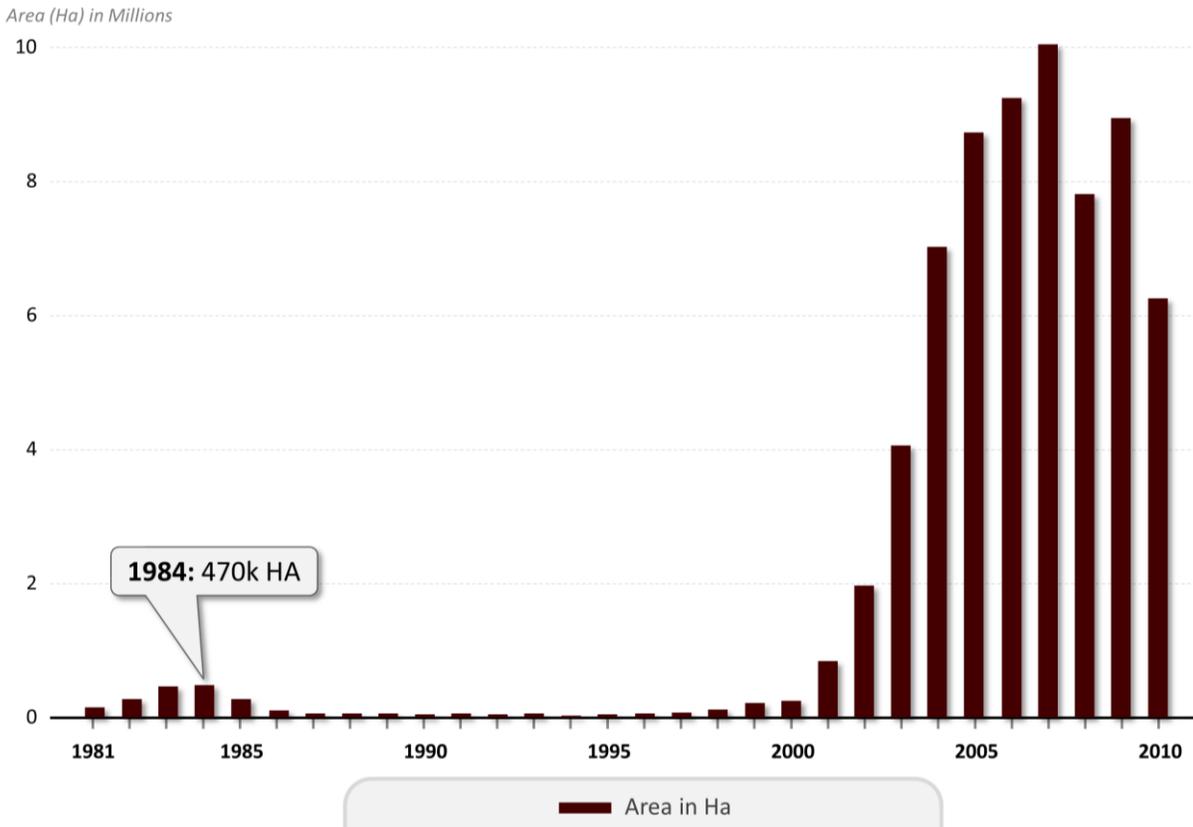


Figure 13: Total area in B.C. (in Ha) attacked by the MPB – 1981 to 2010

¹⁰⁸ *Id.* ¶ 29.

¹⁰⁹ Because the Red Stage may last two years, some of the same areas could be included in more than one bar on this graph. *Id.*

88. During the current outbreak, the MPB has affected to some degree an estimated 17.5 million hectares,¹¹⁰ a larger area than the territory of England. The map below shows the cumulative area and severity of the MPB attack in terms of the percentage of pine trees killed in British Columbia as of 2009.¹¹¹

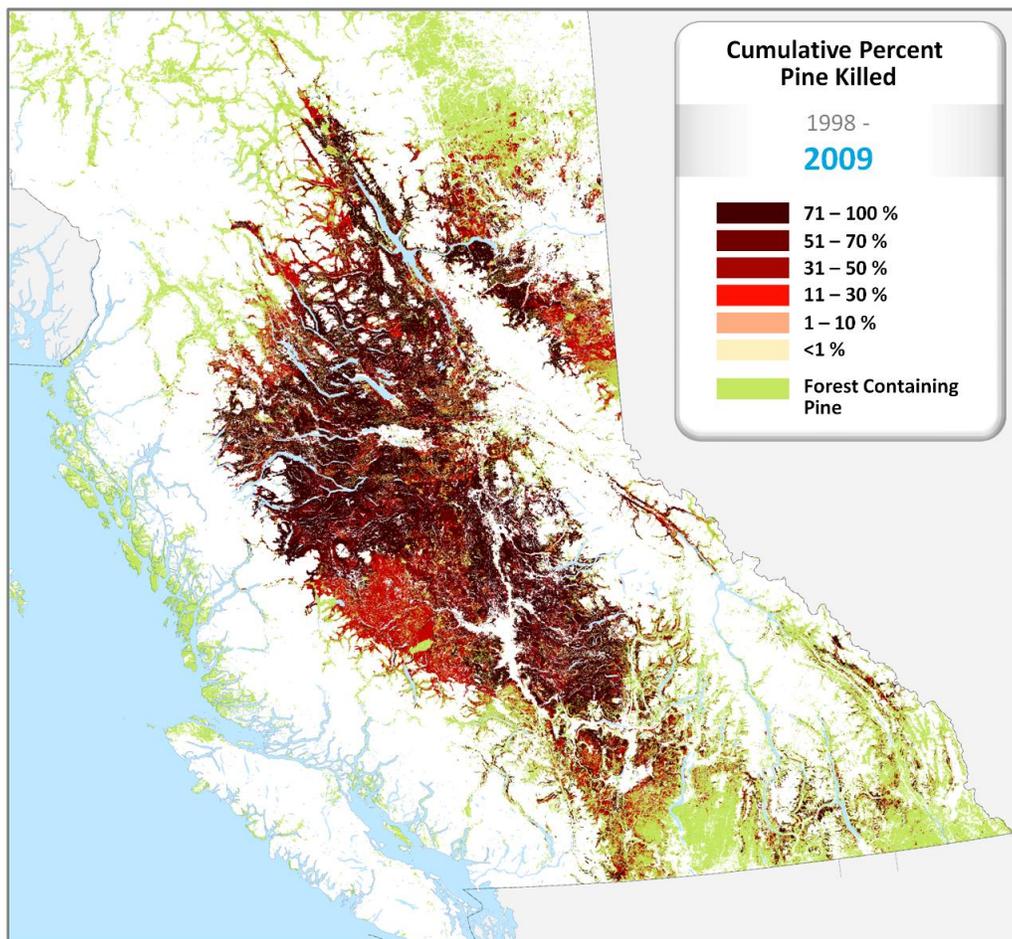


Figure 14: Cumulative area and severity of MPB attack – 1998 to 2009. For a series of maps showing the same from 1998 to 2009, see Ex. R-51.

¹¹⁰ http://www.for.gov.bc.ca/hfp/mountain_pine_beetle/facts.htm

¹¹¹ See Ex. R-51 for Maps Showing Cumulative Percent Pine Killed.

89. The MPB infestation that led to the current outbreak began in the mid-1990's in Tweedsmuir Park, which covers nearly a million hectares of the west-central B.C. Interior.¹¹² By 1999, aerial surveys showed substantial areas of Red Stage in the central Interior beyond Tweedsmuir.¹¹³ The outbreak expanded quickly after that. From 2000 to 2001, the observed attack area more than doubled. The area attacked more than doubled again from 2001 to 2002 and again from 2002 to 2003. The beetle continued to spread, with the maximum area under Red Stage (meaning that trees had been killed one to two years earlier) peaking in 2007.¹¹⁴

90. Official estimates of the volume of pine killed indicate that approximately 8 million cubic metres of pine were killed in 1999.¹¹⁵ In 2003, the MPB killed approximately ten times that volume: 80 million cubic metres. The next year, the MPB achieved its single-year peak volume killed: 140 million cubic metres.¹¹⁶ In each of 2005 and 2006, the beetle killed approximately 110 million cubic metres. By the end of 2006, the MPB had killed approximately 550 million cubic metres of lodgepole pine, and roughly two-thirds of that

¹¹² Ebata Stmt. ¶ 28 (Ex. R-4); [] (Ex. R-2).

¹¹³ Ebata Stmt. ¶ 29 (Ex. R-4)

¹¹⁴ *Id.*

¹¹⁵ See Adrian Walton, Provincial-Level Projection of the Current MPB Outbreak (June 2010) and the Related Summary of Kills Workbook, available at <http://www.for.gov.bc.ca/hre/bcmpb/year8.htm> .

¹¹⁶ Ebata Stmt. ¶ 31 (Ex. R-4).

was killed in the period from 2004 through 2006. By comparison, the largest volume of lodgepole pine harvested in a single year was 36 million cubic metres (in 2005).¹¹⁷

91. From 1999 through 2010, an estimated *692,000,000 cubic metres*¹¹⁸ of mature (*i.e.*, 60 years or older) lodgepole pine was killed by the MPB in the B.C. Interior.¹¹⁹ That represents 51 percent of the estimated mature lodgepole pine volume on the B.C. timber harvesting land base as of 1999.¹²⁰ This volume exceeds the volume of all lodgepole pine harvested in the B.C. Interior from 1980 through 2010. The graph below shows the cumulative volume of Red and Grey Stage pine killed by the MPB since 2000, and British Columbia's projection of what that quantity will be by 2020.¹²¹

¹¹⁷ *Id.*; Harvest Billing System Data (Ex. R-24).

¹¹⁸ To put this figure into perspective, a standard sized telephone pole (~20-feet) contains roughly 1 cubic metre of timber. Six hundred and ninety two million telephone poles, if laid end to end, would encircle the circumference of the earth more than 100 times.

¹¹⁹ Adrian Walton, BC Forest Service, Provincial-Level Projection of the Current Mountain Pine Beetle Outbreak (June 2011), at 10 (Ex. R-52).

¹²⁰ *Id.*

¹²¹ *Id.* at 11.

Entire Province Timber Harvesting Land Base

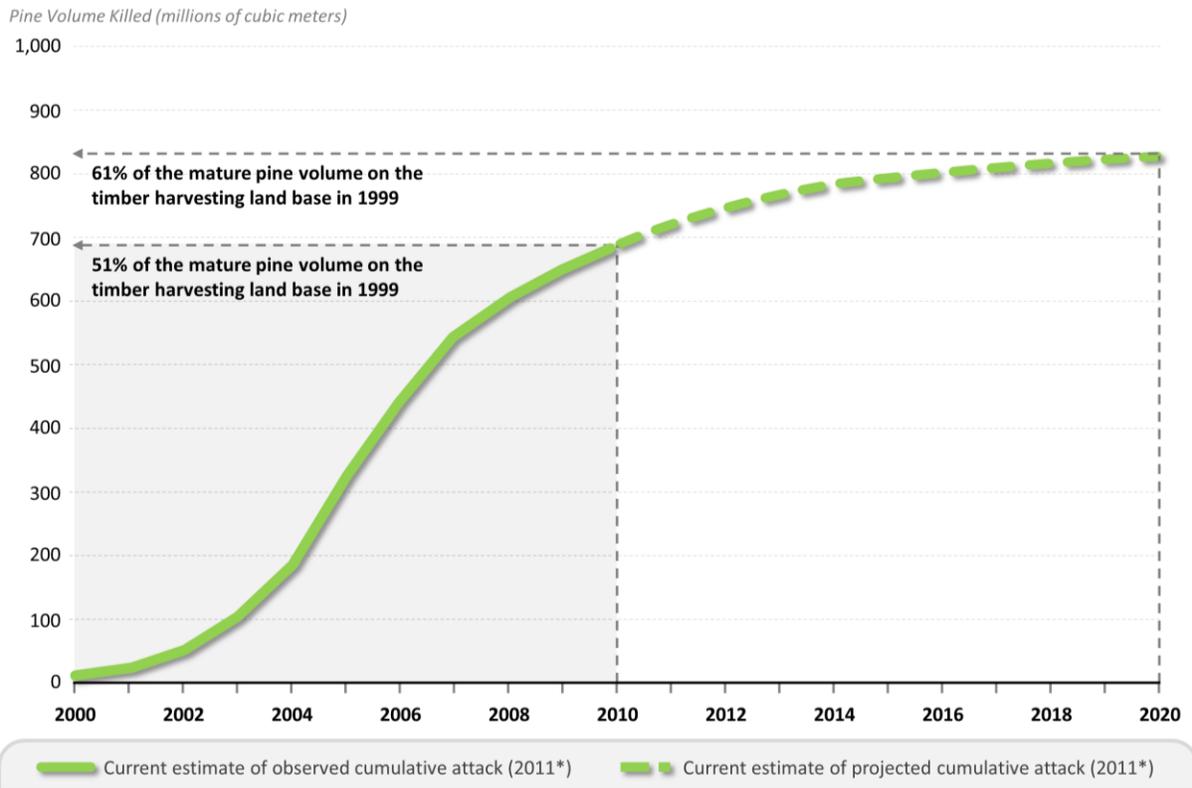


Figure 15: Observed and projected cumulative volume of Red and Grey Stage pine, 2000 to 2020

4. The Policy Response to the Outbreak

92. Efforts to understand and control the outbreak began in the late 1990s and expanded in the early 2000s. As explained in the statements of Jim Snetsinger, British Columbia’s Chief Forester, Tim Ebata, British Columbia’s Forest Health Officer, and

[] active roles were played by the B.C.

provincial government, the Canadian federal government, and the B.C. Interior forest industry.¹²²

93. Early efforts focused on attempting to contain the spread of the beetle while waiting for a spell of very cold weather to dampen or extinguish the outbreak.¹²³ The size of the outbreak, however, necessitated a concerted effort, and to that end the first Mountain Pine Beetle Action Plan was developed in 2001.¹²⁴ These efforts included “leading edge” harvesting and “fall and burn” operations.¹²⁵ The goal in both cases was to try to kill the beetles and remove or destroy the infested host trees.

94. From 2002 through 2004, the predominant approach to the beetle was aggressive control and sanitation, with a moderate increase each year in the areas in which MPB control no longer remained practical and the policy had shifted to salvaging what had already been killed. [

] ¹²⁶

¹²² See Snetsinger Stmt. ¶¶ 27-31 (Ex. R-7); Ebata Stmt. ¶¶ 34-37 (Ex. R-4); [] (Ex. R-2).

¹²³ Snetsinger Stmt. ¶ 27 (Ex. R-7); [] (Ex. R-2); [] (Ex. R-5).

¹²⁴ Snetsinger Stmt. ¶¶ 27-28 (Ex. R-7).

¹²⁵ Snetsinger Stmt. ¶ 29 (Ex. R-7); [] (Ex. R-2); Ebata Stmt. ¶ 34 (Ex. R-4).

¹²⁶ [] (Ex. R-2).

95. The Ministry designated each of the emergency management units in one of three categories – aggressive, containment, or salvage/limited action – depending on the action deemed required. According to Chief Forester Snetsinger, “the goal was to identify areas where emergency measures could reasonably be expected to suppress or control beetle populations.”¹²⁷ Where beetle populations had increased to a level such that removal of the brood was considered unlikely, the designation was changed to salvage.¹²⁸ These designations, and the shifting policy approach to dealing with the MPB in different affected areas can be seen in the annual maps of the emergency management units produced by the Ministry each year and reproduced in Figures 16 and 17 for the years 2004 and 2005.¹²⁹

¹²⁷ Snetsinger Stmt. ¶ 28 (Ex. R-7).

¹²⁸ *Id.* ¶ 37; Ebata Stmt. ¶ 35 (Ex. R-4).

¹²⁹ Emergency Bark Beetle Management Area (EBBMA) and Strategic Planning Maps (Ex. R-54).

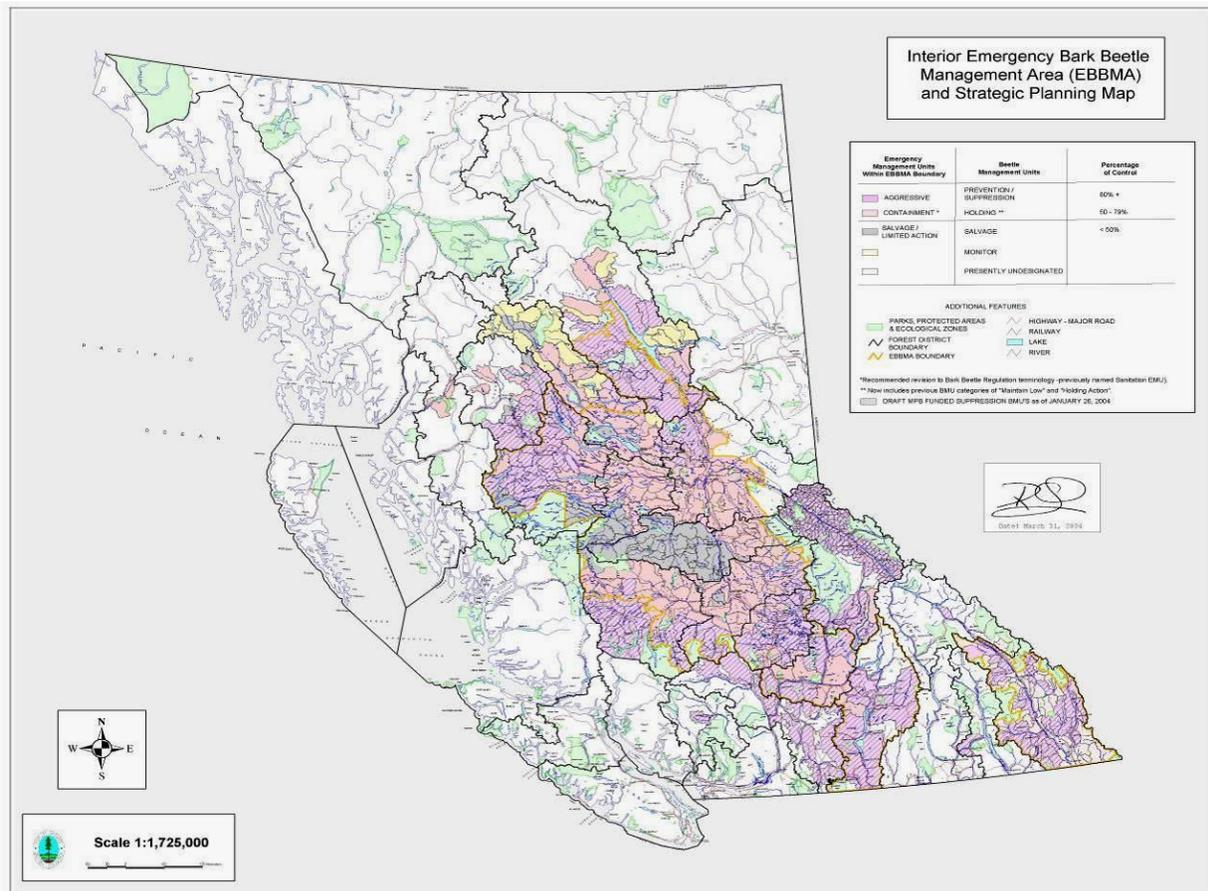


Figure 16: EBBMA and Strategic Planning Map (2004)

96. By 2005, it became clear that, in increasingly large areas of the Interior, particularly at the heart of the outbreak, efforts to contain and suppress the massive beetle populations had proven insufficient. Nature had failed to intervene. In that year, the

approach to the MPB shifted dramatically from control to salvage shown by the area in grey on Figure 17.¹³⁰

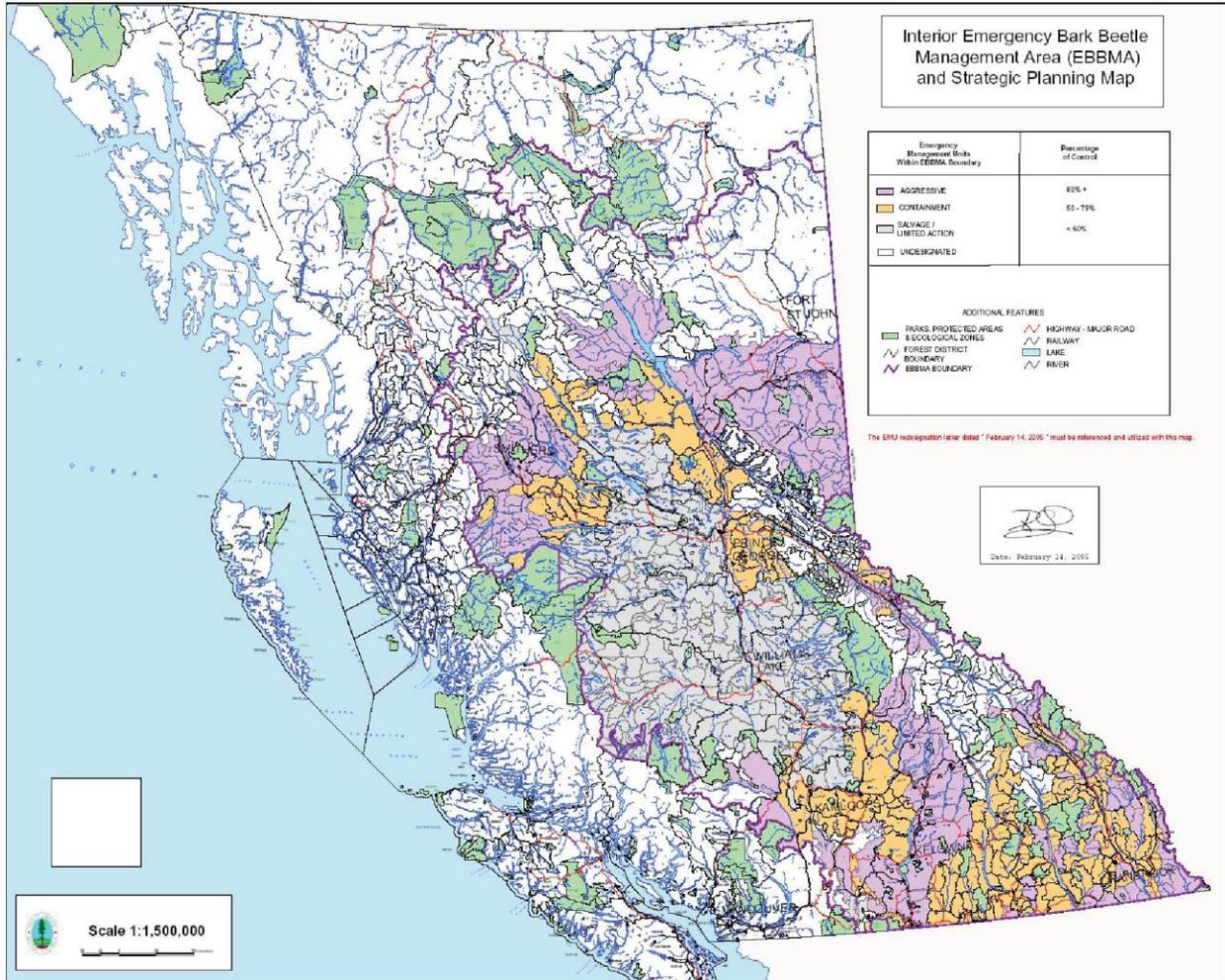


Figure 17: EBBMA and Strategic Planning Map (2005)

¹³⁰ See Ministry of Forest, MPB Action Plan 2005-2010, CAN-001437-60 (Ex. R-58); see also MPB Action Plan 2006-2011 (Ex. R-59).

97. As B.C.'s efforts to combat the MPB shifted to salvaging dead pine trees, the share of pine in the annual B.C. Interior harvest increased relative to other species. Pine represented about 46 percent of B.C.'s timber harvest in 2000, but had grown to 65 percent by 2006.¹³¹

98. The statements of Jim Snetsinger and Dana Hayden explain that salvage was important to the provincial government to ensure reforestation, reduce fire risk, and ensure the health of the forest.¹³² [

] ¹³³

99. The economic rationale behind salvage is explained by Professor Kalt. Salvage economics tells us that if the value of an asset depreciates with time, a rational owner has the incentive to extract value from the assets as quickly as possible.¹³⁴ In contrast to live

¹³¹ Harvest Billing System Data (Oct. 28, 2011) (Ex. R-24).

¹³² Snetsinger Stmt. ¶¶ 40-44 (Ex. R-7); Hayden Stmt. ¶¶ 25-29 (Ex. R-6).

¹³³ [] (Ex. R-5).

¹³⁴ Kalt Report ¶ 42-49 (Ex. R-9).

timber, which under normal circumstances grows and appreciates in value over time, MPB-killed timber depreciates rapidly in the few years after death, and at some point can be expected to become completely unharvestable as the cost of harvesting exceeds the remaining value of the timber.¹³⁵

100. As the MPB outbreak spread, it left behind increasingly large volumes of dead lodgepole pine. To the extent a mill had a choice between harvesting dead pine and harvesting either unattacked pine or other species unaffected by the beetle, it was reasonable to concentrate the harvest on dead pine. The shift in supply to dead pine resulted both from the increasing area of the forest that had been killed by the MPB and the increasing emphasis on harvesting MPB-killed pine based on salvage rationale. [

] ¹³⁶ [

] ¹³⁷ As Professor Kalt notes, much of the timber that

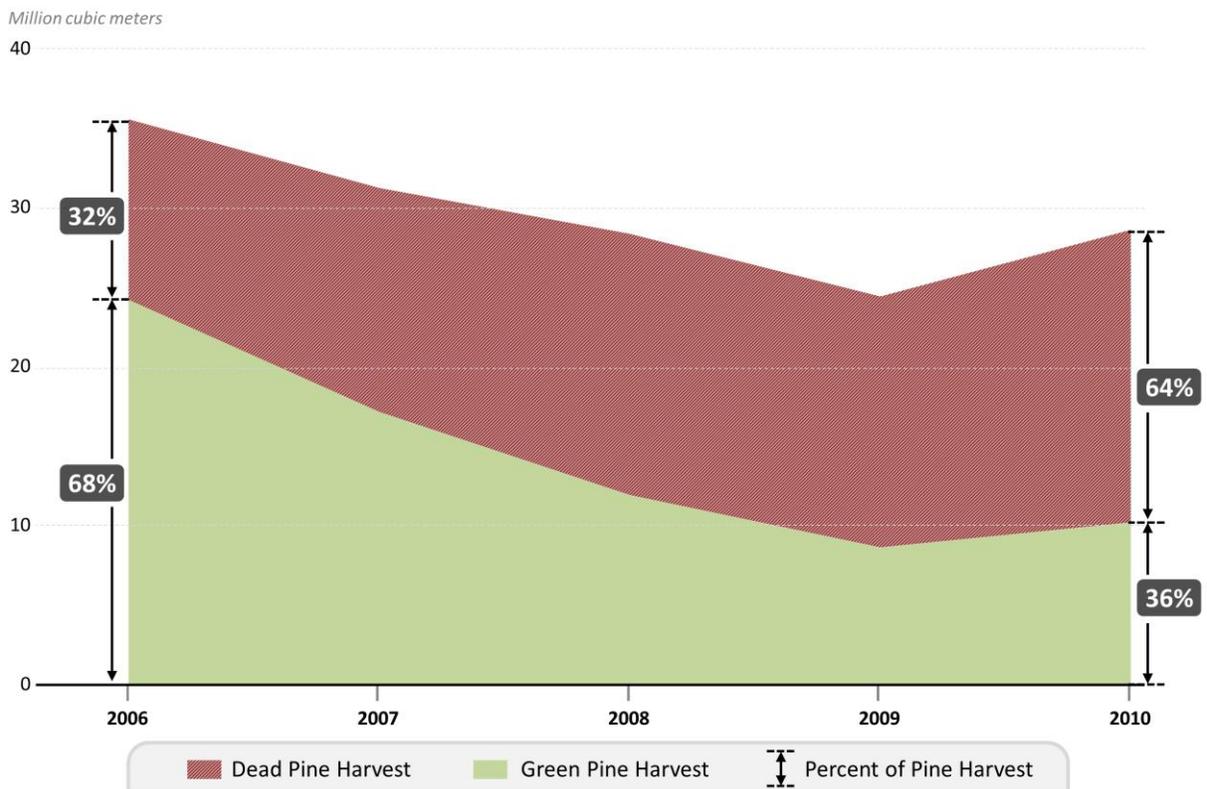
¹³⁵ Kalt Report ¶ 45 (Ex. R-9).

¹³⁶ [] (Ex. R-5).

¹³⁷ [] (Ex. R-2).

has been killed by the mountain pine beetle will not be harvested.¹³⁸ Figure 18 illustrates the growing percentage of dead pine in the B.C. harvest.

The Shift to Dead Pine



Source: BC Harvest Data - final for brief Nov 2011 (HMR)

Figure 18: Graph illustrating the shift to dead pine as percent of pine harvest (See Snetsinger Stmt., App. A.1).

101. Lumber mills in the affected regions had little choice but to adapt to the increasing supply of MPB-killed wood. [

¹³⁸ Kalt Report ¶ 53 (Ex. R-9); see Snetsinger Stmt. ¶ 49 (Ex. R-7).

down. []¹³⁹ Mills that did not adapt economically shut

] ¹⁴⁰

102. Consistent with global trends, average temperatures in the B.C. Interior have continued to rise, and the severe cold that ended previous outbreaks has not occurred since the current outbreak began.¹⁴¹

¹³⁹ [] (Ex. R-2); *see also* [] (Ex. R-5); *View From the Top: Kayne Takes Charge at Canfor*, Logging and Sawmill Journal, May-June 2011 (quoting CEO of Canfor, Canada’s second largest lumber producer, as stating -“we’re spending a good chunk of the capital at the sawmills” on “optimization” to adapt to beetle-killed wood.) (Ex. R-125). *See also* Joint Expert Report of Darrell Wong and John Taylor (hereinafter, “Wong & Taylor”) [] (Ex. R-12).

¹⁴⁰ [] (Ex. R-2).

¹⁴¹ Snetsinger Stmt. ¶ 30 (Ex. R-7).

B. THE CHALLENGES TO BRITISH COLUMBIA'S SCALING SYSTEM PRESENTED BY THE DEGRADATION OF THE FOREST

103. As of 2006, B.C. officials understood many of the challenges and consequences of the MPB outbreak. They were not, however, omniscient. Contrary to U.S. assertions, B.C. officials did not understand and anticipate all of the challenges the MPB outbreak presented by the time the April 2006 log grades were adopted.¹⁴²

104. At the level of government policy, efforts had been focused on forest management – understanding and controlling the spread of the beetle and developing strategies to ensure the Province's medium and long-term timber supply. For instance, by 2006, sophisticated techniques had been developed to track and predict the spread of the MPB.¹⁴³ The biology of the MPB had been studied extensively, and different methods of control had been tested and refined. Likewise, approaches to forest management – such as increases in annual allowable cuts – were developed and applied to ensure that MPB-killed stands were being harvested and replanted.¹⁴⁴

105. Other than the expectation that dead lodgepole pine would represent an increasing share of the harvest, B.C. officials, in 2005-2006, had a limited understanding of

¹⁴² Stmt. of Case ¶¶ 50, 52.

¹⁴³ Ebata Stmt. ¶ 27 (Ex. R-4).

¹⁴⁴ Snetsinger Stmt. ¶ 45 (Ex. R-7).

the full effects that the MPB would have on the harvest, given the massive volume of dead pine (and the attendant challenges in harvesting and processing the damaged timber), as well as scientific uncertainty around the deterioration of the timber. As Chief Forester Snetsinger explains in his statement, predictions of the “shelf life” of MPB-killed pine varied widely when he became Chief Forester in late 2004, and continued to vary in subsequent years.¹⁴⁵ Likewise, in 2006 Professor Lewis wrote that there had been only limited research on the deterioration of MPB-killed pine in British Columbia.¹⁴⁶

106. The volume of harvested trees that had been dead for more than two years began to increase not long after the April 2006 log grades took effect. The longer-dead wood was dryer and exhibited more checking than the freshly-killed wood on which the April 2006 log grades were developed and tested.¹⁴⁷

107. Scalers frequently experienced difficulty identifying checks in MPB-killed logs.¹⁴⁸ Trees that have been killed by the MPB are dry, but, as a result of the blue stain, are also more permeable to moisture than unaffected wood.¹⁴⁹ As a result, MPB-killed logs tend to absorb moisture very quickly when it is present in the atmosphere or due to wet site

¹⁴⁵ Snetsinger Stmt. ¶¶ 34, 35 (Ex. R-7).

¹⁴⁶ Lewis, K., Thompson, R.D., Hartley, I. and Pasca, S., 2006. Wood Decay and Degradation in Standing Lodgepole Pine Killed by MPB, at iii (Ex. R-73).

¹⁴⁷ Crover Stmt. ¶ 68 (Ex. R-3).

¹⁴⁸ Crover Stmt. ¶ 72 (Ex. R-3).

¹⁴⁹ Lewis Report ¶ 49 (Ex. R-10).

conditions in the form of rain, snow or high humidity – common conditions in the B.C. Interior during the principal harvesting season. When a log absorbs moisture, it swells and checks disappear.¹⁵⁰ The checks are still there, and still occupy volume that is unavailable for the manufacture of fracture-free lumber, but they are difficult to detect and measure, especially in wet weather conditions.¹⁵¹ [

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108. These are the conditions in which the share of the pine harvest represented by Grade 4 logs began to increase. It is important to recognize, however, that the percentage (discussed at length by the United States) increased more dramatically than the actual volume (which the United States hardly mentions). The figure below shows the volume of British Columbia's pine harvest from 2006 through 2010, overlaid with lines showing (1) the volume of the Grade 4 portion of that harvest, (2) the percentage of the pine harvest represented by that Grade 4 volume, and (3) the percentage of the total harvest represented by Grade 4 pine. Because the volume of the overall harvest declined from 2006 through

¹⁵⁰ Oliveira Report ¶ 60 (Ex. R-11).

¹⁵¹ *Id.*

¹⁵² [] (Ex. R-2).

2009, and because the proportion of pine in the harvest increased from 2006 to 2007 to 2008 to 2009, the percentage of Grade 4 pine in the harvest climbs much more steeply than does the actual volume of Grade 4 pine.

Percentage of Grade 4 Pine Compared to Actual Volume

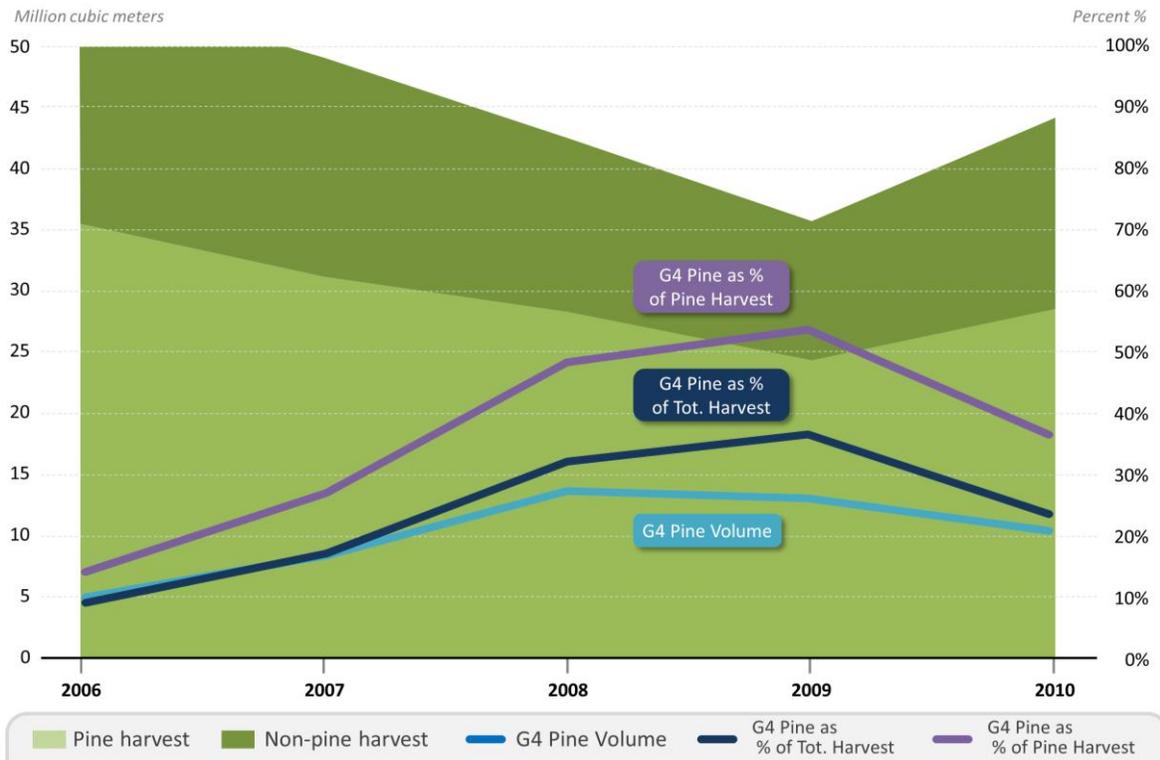


Figure 19: Grade 4 pine as percent of pine harvest as compared to actual volume

ARGUMENT

I. THE UNITED STATES HAS FAILED TO ESTABLISH THAT BRITISH COLUMBIA CIRCUMVENTED THE SLA

A. APPLICABLE LAW

109. The governing law in this arbitration is the SLA as *lex specialis*.¹⁵³ The rules of construction of the Vienna Convention on the Law of Treaties (“VCLT”)¹⁵⁴ also apply, as does customary international law relevant to the interpretation of treaties.¹⁵⁵ Article 31 of the VCLT provides *inter alia*, that:

A treaty shall be interpreted in good faith in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.

110. Article 32 allows supplementary means of interpretation, including recourse to the preparatory work of the treaty and the circumstances of its conclusion, in appropriate circumstances.

B. BURDEN OF PROVING THE ELEMENTS OF CIRCUMVENTION

111. It is widely accepted in international arbitration proceedings that a party making an allegation of fact has an obligation to demonstrate that fact with sufficient

¹⁵³ 81010 Award ¶ 109 (CA-6).

¹⁵⁴ Vienna Convention on the Law of Treaties, May 23, 1969, 1155 U.N.T.S. 331 (RA-4).

¹⁵⁵ Stmt. of Case ¶¶ 19-20 and n.18.

evidence¹⁵⁶ The Tribunal in LCIA Arbitration No. 81010 recognized that this fundamental principle governed proceedings in which circumvention of the SLA is alleged:

In order to avail itself of the presumption {of circumvention} provided in the first sentence of Article XVII(2), the Claimant must establish that grants or other benefits have been provided and that these grants and benefits meet the criteria set forth in this same sentence (i.e., they are provided by a Party, including any public authority of a Party, on either a *de jure* or *de facto* basis, to producers or exporters of Canadian Softwood Lumber Products).¹⁵⁷

112. Thus, in order to prevail in its claims under Article XVII in this case, the United States must establish that: (1) the government complained against has taken an action; (2) the action has provided a grant or other “benefit;” and (3) the benefit was provided to exporters or producers of Canadian Softwood Lumber Products as that term is defined in the Agreement. If the United States fails to establish these elements, no violation of Article XVII – no circumvention – can be found to have occurred.

¹⁵⁶ Charles N. Brower, *Evidence Before International Tribunals: The Need for Some Standard Rules*, 28 Int'l 47, 49 (1994) (“Burden of proof in international procedure is grounded on the general obligation of the parties to present evidence before the adjudicating tribunal that the parties deem sufficient to prove their claims. ... In international arbitral proceedings a party making an allegation of fact has an obligation to demonstrate that fact with sufficient evidence. This principle derives from the Roman law rule of burden of proof expressed through certain maxims such as *ei qui affirmat non ei qui negat incumbit probatio* (onus of proof is on he who affirms, and not on he who denies) and *actori incumbit probatio* (the claimant carries the burden of proof).”). The same article also notes that “The lack of standard ‘international rules of evidence,’ and the fact that international tribunals are liberal in their approach to the admission of evidence in no way goes ‘as far as to waive the burden resting upon a claimant to prove his case.’” *Id.* (RA-2).

¹⁵⁷ 81010 Award ¶ 121 (CA-6).

113. With respect to the first element, there must not only be an “action,” but a *government* action. The “inferential” circumvention case that consumes the first 46 pages of the U.S. Statement of Case makes no effort to satisfy this fundamental requirement: it fails to identify a single so-called action of the British Columbia government purportedly linking it to the alleged “misgrading” of logs. For this reason alone, the inferential United States’ case fails as a matter of law. The Tribunal, therefore, need only focus on the second argument made by the United States concerning the four actions that it claims to have constituted a circumvention of the SLA.

114. The next element the United States must establish to prove circumvention is that the alleged circumventing action provides a “grant or other benefit.” According to the United States, British Columbia “changed the provincial timber grading and scaling system in ways that ensured that large amounts of timber were *misclassified* as Grade 4 ‘lumber reject’ and sold at the minimum stumpage rate.”¹⁵⁸ Apparently lacking confidence in its ability to prove this sweeping assertion, the United States retreats in the very next paragraph to contending only that the modifications “succeeded in making logs *more likely* to be misgraded as Grade 4” and that “{t}his *increased likelihood* of logs being misgraded as Grade 4 was a benefit to B.C. softwood lumber producers and exporters.”¹⁵⁹ In its discussion of the four

¹⁵⁸ Stmt. of Case ¶ 95 (emphasis added).

¹⁵⁹ *Id.* ¶ 96 (emphasis added).

alleged “actions,” the United States again defines the alleged benefit as the increased likelihood of misgrading.¹⁶⁰ The core of the United States’ case, therefore, is not that the four actions it identifies actually caused misgrading, but merely increased the likelihood that logs would be misgraded and improperly priced at the minimum stumpage rate.

115. The benefit alleged by the United States – the “increased likelihood of logs being misgraded as Grade 4”¹⁶¹ – does not come close to satisfying Claimant’s burden of proof for triggering the presumption of circumvention in Article XVII(2)(a) of the SLA. As the Tribunal in LCIA 81010 explained:

the Claimant bears the burden of proving the elements triggering the presumption contemplated in the first sentence of Article XVII(2) of the SLA. To meet this burden, the Claimant must show not only that a benefit was *potentially* provided but that it was *indeed* provided.¹⁶²

116. Thus, in order to satisfy its burden of proof, it is not enough for the United States to show that the four actions *increased the likelihood* of misgrading. Rather, to show that a benefit “was indeed provided,” the United States must show that each action *actually caused*

¹⁶⁰ See e.g., *id.* ¶ 101 (“Rather, they show that the Ministry was attempting to standardize new untested practices that increased the likelihood that logs would be classified as Grade 4, regardless of the logs’ suitability for producing lumber...”)(discussing local knowledge); ¶ 114 (“Thus BC implemented a change that was directly aimed at increasing the likelihood that beetle-affected timber would be classified as Grade 4.”)(discussing Scaling Requirements).

¹⁶¹ Stmt. of Case ¶ 96.

¹⁶² 81010 Award ¶ 242 (CA-6) (emphasis in original).

logs that should have been graded as Grade 2 to be misgraded as Grade 4, and that producers paid a lower price for logs than they otherwise should have.

117. With respect to the four so-called government “actions” it has identified, the United States has not offered evidence demonstrating that any of them actually provided a benefit to Canadian producers. The argument advanced by the United States, in each case, amounts to a single and unproven assertion – that the action “diverted more timber into Grade 4.”¹⁶³

118. Neither the United States nor its economist makes any effort to show how each action actually caused a rise in Grade 4. Even if the United States could show that B.C.’s actions caused the diversion of timber into Grade 4, the United States would still not satisfy its burden of proof unless it could establish that the actions caused Grade 2 logs to be misgraded as Grade 4 logs and that producers paid a lower price for logs than they otherwise would have.¹⁶⁴ The United States makes no attempt to show how each action actually caused a rise in the number or percentage of Grade 4 logs, how each action caused scalers to misgrade logs as Grade 4, or to demonstrate that any of these actions resulted in producers paying lower prices for their logs.

¹⁶³ Stmt. of Case ¶ 103.

¹⁶⁴ 81010 Award ¶ 242 (CA-6).

119. The final element that the United States must satisfy in order for the Tribunal to find a presumption of circumvention is that the benefit must be provided to producers or exporters of Canadian Softwood Lumber Products. Here, the United States has not shown that a benefit that may have been conferred on harvesters of timber through lower stumpage rates for improperly graded logs, has been passed through to exporters or producers of softwood lumber.

120. The United States, therefore, has failed to prove any of these three elements. Unsubstantiated allegations do not discharge a party's burden to prove its claims. This is particularly true in international proceedings between sovereign states. As explained by the British-Mexican Claims Commission of 1926 in rejecting a claim for compensation for a railroad accident:

The Commissioners do not deny that the description of the derailment, as given by the claimant, and taken as a whole, {bears} a certain appearance of truth, but a judicial decision cannot be based on this personal impression alone. If they were to do justice on such a subjective and uncertain foundation, an element of considerable frailty, and even whimsicality, would be introduced into international jurisdiction. A decision which imposes upon a state a financial liability towards another state, cannot rest solely upon the unsupported allegations of the claimant.¹⁶⁵

¹⁶⁵ Claim of W. Allen Odell, Reports of International Arbitral Awards, British-Mexican Claims Commission, Volume V, pp. 133-306, at 154, ¶ 4 (24 March 1931-6 August 1932) (RA-3).

Mexico had denied the claim on the basis that, “there was no proof that the accident suffered by the claimant was due to the acts of men. It could just as well have been the consequence of a defect of the switch.”¹⁶⁶ Faced with the United Kingdom’s plausible but unsubstantiated theory that the accident was caused by revolutionaries, the Commission held that:

If an international tribunal were to accept all these allegations without evidence, it would expose itself to the not unjustifiable criticism of placing jurisdiction as between nations below the level prevailing in all civilized states for jurisdiction as between citizens....That in the admission of evidence great liberality can obtain, has been shown by the Commission on several occasions, but in the present claim there is no question of the admission or the value of evidence: there is an absence of evidence and the greatest liberality cannot overcome this defect.¹⁶⁷

121. If the Tribunal, nevertheless, finds that the United States has established each of the elements of circumvention, the presumption of circumvention can be rebutted by Canada if it demonstrates that the action falls within one of the grandfathering or safe harbour provisions of Article XVII. In this case, subparagraph (a) of paragraph 2 and paragraph 4 of Article XVII are relevant.

122. In order for a measure to fall within paragraph 2(a), it must satisfy two criteria. First, it must be an action that is part of a timber pricing or forest management system, and second, the system must have existed on July 1, 2006. If both elements are satisfied, the

¹⁶⁶ *Id.* at 154, ¶ 2.

¹⁶⁷ *Id.* at 155, ¶ 5.

language of the Agreement is clear – there is no circumvention. If the measure is a post-July 1, 2006 modification or update of an existing timber pricing or forest management system, it too is covered by safe harbour 2(a) if it “maintain{s} or improve{s} the extent to which stumpage charges reflect market conditions, including prices and costs.”¹⁶⁸

123. The second applicable grandfathering provision is Article XVII(4), a provision specific to British Columbia. Paragraph 4 grandfathers B.C.’s Market Pricing System by providing that the MPS “shall be considered a provincial timber pricing or forest management system that existed on July 1, 2006.”¹⁶⁹ In so doing, paragraph 4 brings the MPS under the grandfathering provision of Article XVII(2)(a).

124. In considering whether an action is grandfathered or safe harboured under Article XVII(2)(a), it bears repeating that these provisions protect all actions that fall within their parameters – regardless of whether the actions confer a benefit on producers or exporters of Canadian Softwood Lumber Products. Indeed, the grandfathering and safe harbour provisions are designed to protect actions that may provide benefits.

125. Finally, with respect to the compensatory adjustments that would be appropriate in the event that the Tribunal were to find that any of the alleged actions by British Columbia provided benefits to B.C. softwood lumber producers, the United States

¹⁶⁸ SLA 2006 Art. XVII(2)(a) (Ex. R-1).

¹⁶⁹ SLA 2006 Art. XVII(4)(a) (Ex. R-1).

has the burden of showing the extent to which such benefits reduced or offset the Export Measures, meaning that they had an effect on the U.S. market and harmed U.S. producers. As the tribunal in the 81010 Arbitration explained, “disregarding the difference between the *benefits* provided by the programs in breach of the SLA and the offsetting *effects* of such benefits on the Export Measures would lead to collecting amounts in excess of those needed to restore the level playing field initially established by the Export Measures.”¹⁷⁰ The United States makes no attempt whatsoever to satisfy this burden, choosing instead to dismiss the 81010 tribunal’s findings on this issue altogether.

II. BRITISH COLUMBIA HAS NOT CIRCUMVENTED THE SLA

126. The Statement of Case is divided into two distinct arguments. In the first, the inferential case, the United States asserts that because neither it nor its economist can explain the rise in Grade 4 logs, that rise must have been caused by misgrading. This part of the United States’ case, based entirely on speculation and conjecture, establishes none of the elements required to make out a circumvention claim. Nonetheless, Canada addresses this argument in Part A below and establishes that the inferences the United States asks the Tribunal to draw are unsupported and demonstrably wrong.

¹⁷⁰ 81010 Award ¶ 349 (CA-6) (emphasis added).

127. In the second argument, the actions case, the United States alleges that British Columbia made four “changes” to its system for scaling timber that the United States claims “increased the likelihood” of logs being misgraded Grade 4, and that this mere likelihood constitutes a benefit to B.C. softwood lumber producers and exporters. Canada shows in Part B below that this argument also fails. The United States has failed to show that any of the so-called changes led to misgrading of Grade 4 logs or that producers paid a lower price for logs than they otherwise would have. It therefore has again failed to establish the elements necessary for the Tribunal to find a presumption of circumvention. The so called actions also are part of B.C.’s grandfathered forest management systems, or are alternatively safeharboured, and are thus immune from claims of circumvention in any event.

A. THE UNITED STATES’ “INFERENCE” CASE FAILS

128. The United States’ inferential case focuses on the fact that the percentage of the B.C. Interior harvest represented by Grade 4 lodgepole pine increased relative to the shares of other grades after the SLA took effect in October 2006. The United States asks the Tribunal to infer from that increase that there must have been a circumvention of the SLA through misclassification of logs as Grade 4. This inferential case rests on two false premises: (1) that the SLA grandfathered specific levels of Grade 4 that were purportedly anticipated as of April 2006 and (2) that the accuracy of log grading can be determined by how well it predicts lumber recoveries, such that an increase in Grade 4 unaccompanied by a significant decline in lumber recovery demonstrates misgrading.

129. From these false premises, the United States seeks to lead the Tribunal down three erroneous lines of reasoning. The United States argues: (1) that the increases in the percentage of Grade 4 timber had no relationship to the effects of the Mountain Pine Beetle on the timber harvested in the B.C. Interior;¹⁷¹ (2) that no decline in lumber volume or value corroborates the increase in low-quality, Grade 4 logs;¹⁷² and (3) that relative lumber recoveries from Green and Grey Stage logs from single test runs at four Interior sawmills in 2007-2008 demonstrate misgrading of lodgepole pine in the Interior harvest.¹⁷³ Each of these arguments is erroneous, and the facts rebut the inference of misgrading that the United States seeks to draw from each.

1. The Inferential Case Is Based on False Premises

a. False Premise 1: The April 2006 Changes to the Scaling Regime Anticipated All Effects of the Mountain Pine Beetle

130. Critical to the United States' case are its claims that the April 2006 changes to the B.C. Scaling Regime anticipated all future effects of the Mountain Pine Beetle infestation and that those changes were fundamental to the bargain struck in the SLA.¹⁷⁴ Both the U.S. description of the April 2006 changes and the claims made with respect to them are self-

¹⁷¹ See, e.g. Stmt. of Case ¶¶ 72, 78.

¹⁷² See, e.g. Stmt. of Case ¶¶ 65, 66.

¹⁷³ See, e.g. Stmt. of Case ¶¶ 84, 86-89.

¹⁷⁴ Stmt. of Case ¶¶ 37-49.

serving and incorrect. The April 2006 changes did not anticipate all effects of the MPB, nor were the changes fundamental to the bargain struck under the SLA.

131. On their face, the April 2006 log grades establish rules and procedures for assigning grades to logs based on the physical characteristics of those logs. Before April 2006, B.C. scalers assigned timber to one of the following grades:

Interior Log Grades Prior to April 2006¹⁷⁵		
Grade Code Blank	Sawlog	For pine – a least 50% of the gross scale available to manufacture lumber, 50% of which must be merchantable
Grade Code 3	Dead and Dry Sawlog	From trees which were dead and dry when harvested
Grade Code 4	Lumber Reject	Lower in grade than sawlog but higher in grade than firmwood reject (Z)
Grade Code 5	Dead and Dry Lumber Reject	
Grade Code 6	Undersized Log Grade	
Grade Code Z	Firmwood Reject	

Figure 20: Interior log grades before April 2006

132. In order to determine the grade of a log under the old system, the scaler had to exercise his or her judgment to determine whether there was sufficient observable evidence to determine if the log had been cut from a tree that was already dead. The new system adopted in April 2006, instead of classifying timber based on whether it had been

¹⁷⁵ Scaling Regulation, B.C. Reg. 446/94, Schedule of Interior Timber Grades – All Species (Ex. R-22).

killed before harvest, contemplated that grades should be based on visible physical characteristics generally understood to be relevant to a log's likely suitability for the manufacture of fracture-free, merchantable lumber, regardless of the vitality of the log at the time of harvest.¹⁷⁶

133. The log grades that were adopted as of April 2006 were first tested in late 2005. The tests were conducted on logs harvested from stands attacked by the MPB a year or two earlier.¹⁷⁷ Most of the logs, therefore, did not have deep checks. The new grading system eliminated the difference in grades based on whether the log was green or dead and dry at the time of harvest. It created a simpler and more consistent system of classifying timber based on the log size and quality at the time it was scaled. The grade changes eliminated Grade 3 and Grade 5, redefined Grade 4, and created new Grades 1 and 2.

134. The grade system after the April 2006 change was as follows:

¹⁷⁶ Crover Stmt. ¶ 67 (Ex. R-3); Grade 3 Discussion Paper (Jun. 4, 2004), CAN-000014-26 (Ex. R-25).

¹⁷⁷ Crover Stmt. ¶ 68 (Ex. R-3).

Interior Log Grades April 1, 2006 ¹⁷⁸		
Grade Code 1	Premium Sawlog	10 cm or more in radius – 75% available for manufacture of which 75% merchantable.
Grade Code 2	Sawlog	For pine – a least 50% of the gross scale available to manufacture lumber, 50% of which must be merchantable.
Grade Code 4	Lumber Reject	Higher in grade than firmwood reject (Z) but lower in grade than sawlog.
Grade Code 6	Undersized Log Grade	No change
Grade Code Z	Firmwood Reject	No change

Figure 21: Interior log grades as of April 1, 2006

135. The Ministry’s rationale in deciding to eliminate Grades 3 and 5 was that these changes addressed the problems surrounding the increasingly difficult determination of whether a log came from a tree that was already dead at the time of harvest and would, as a result, increase the consistency among scalers. The Ministry also believed that the change would allow it to move forward with market based reforms by introducing, in the Interior, “quality” as the determinant of grade.¹⁷⁹

136. The Ministry analyzed the impact of the proposed grade change on the Grade 3 logs being harvested in 2005-2006. B.C.’s analysis showed that approximately 5 percent to 10 percent of the then existing Grade 3 volume would be scaled as Grade 4 under the new

¹⁷⁸ See B.C. Reg. 15/2006 (Ex. R-142) and B.C. Reg. 80/2006 (Ex. R-143), amending Scaling Regulation, B.C. Reg. 446/94, Schedule of Interior Timber Grades – All Species (Ex. R-22).

¹⁷⁹ Crover Stmt. ¶ 54 (Ex. R-3).

grades, and that the vast bulk of that Grade 3 volume would be graded as Grade 1 or Grade 2 sawlogs under the new grades.¹⁸⁰ It was not surprising that most Grade 3 logs were scaled as Grade 2 under the new grades. After all, the old definition of Grade 3 logs (dead and dry logs that satisfy the 50/50 test) used the same 50/50 test as the new Grade 2 definition. The only difference was that the new grades eliminated the old distinction between green sawlogs and dead or dry sawlogs. But the informal tests and the 100-load test¹⁸¹ conducted in late 2005 were only a “snapshot” as of the time they were conducted. They were not intended to be nor were they predictive of future trends. Nor, contrary to the United States’ unsupported insinuation,¹⁸² did the Ministry attempt to calibrate the new log grades to lumber recovery in mills.¹⁸³

137. The characteristics of the logs entering the scale sites changed after April 2006. With the peak of the attack (measured in terms of the area observed to enter the Red Stage) occurring in 2004 and 2005, beetle-killed trees harvested in 2005 (when the new log grades were tested) and in 2006 (the first year of the SLA) had probably been dead for no more than a year or two. However, as the backlog of trees that had been killed by the

¹⁸⁰ See Ministry of Forest and Range, “Interior Log Grades – Issues and Decisions” (Mar. 3, 2006), CAN-029620-48 at CAN-029625 (The major difference between Grade 1 and Grade 2 is the diameter of the log.) (Ex. R-144).

¹⁸¹ See Crover Stmt. ¶ 59 (noting formal testing of proposed grades on 100 loads).

¹⁸² Stmt. of Case ¶ 109 (“BC had extensively researched the effects of checks on lumber recovery while developing and testing the 2006 reforms grandfathered by the SLA.”).

¹⁸³ Crover Stmt. ¶ 66 (Ex. R-3).

Mountain Pine Beetle increased, the standing dead trees began to deteriorate, and the defects in those dead trees multiplied. As illustrated in the figure below, the harvest could not keep up with the beetle's devastation, and British Columbia's inventory of standing dead trees began to grow. The volume of unharvested trees that had been dead for more than two years grew relative to trees that had been dead less than two years. The same inventory of beetle-killed trees that had yielded Grade 3 in the immediate wake of the MPB's peak continued to age until it was harvested. As the inventory aged, it dried out, and much of it developed checking severe enough to push significant volumes of what had been Grade 3 across the line into Grade 4. It is not surprising, in retrospect, that logs exhibiting sufficient checking to be classified as Grade 4 increased in number. The graph below (Figure 22) compares the volume of pine harvested each year from 1999 through 2010 with the cumulative inventory of dead pine available for harvest in those years.

Annual Pine Harvest v. Estimated Cumulative Unharvested Dead Pine

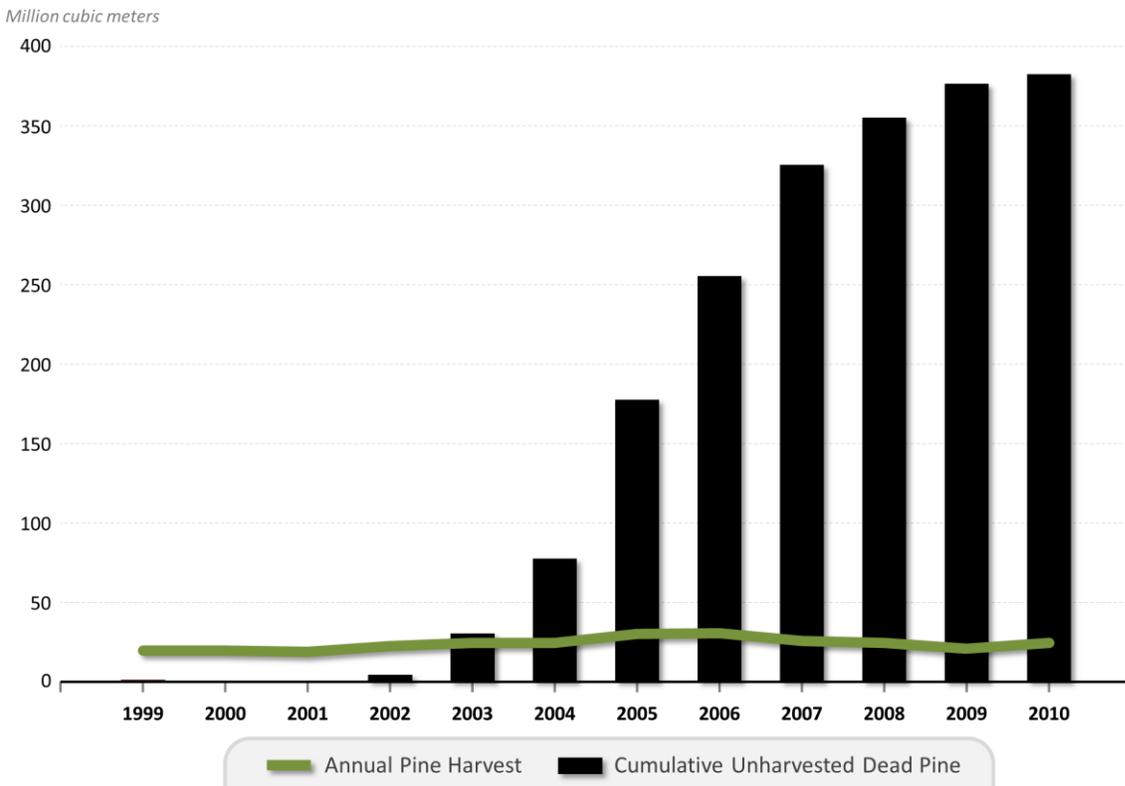


Figure 22: Annual pine harvest as compared to estimated cumulative unharvested dead pine

138. The United States also asserts that certain changes to the B.C. “Cruise Compilation Manual,” rather than the April 2006 log grades, were designed to fully capture all future effects of the MPB on timber quality.¹⁸⁴ The specific changes on which Dr. Neuberger and the United States focus relate to the LRF Adjustment Factors used to

¹⁸⁴ Neuberger Report ¶¶ 27-28; ¶ 54 (stating that “at most, the beetle infestation should result in ‘market based’ adjustments in the Grade 1 and Grade 2 log stumpage prices for MPB-affected timber.”); ¶ 85 (“grey-attack has been accounted for in the formulation of stumpage rates in several ways.”) (C-2).

adjust the prices of Grades 1 and 2 sawlogs based on the stage of MPB attack in the stands from which they are harvested.¹⁸⁵ The LRF adjustment factor is based on the assumption that a Grade 2 log harvested from a grey-stage stand will have a lower value than a Grade 2 log harvested from an unattacked stand. Within the MPS system, the LRF adjustments did affect relative stumpage rates but had no material effect on the average stumpage rate or total government revenue because of the way in which all stumpage rates are aligned to the Average Market Price.¹⁸⁶ More importantly, these LRF adjustments do not displace the system of log grading, which assesses log grade based on characteristics of the log, not of the stand from which it is harvested.

139. The United States' intimation that it was assured that the new log grades would maintain a particular percentage of Grade 4 in the pine harvest is not supported by the text of the SLA. Nor is the U.S. assertion that the April 2006 log grade changes "were a condition of the SLA," agreed to by the Parties to eliminate the "windfall to producers purchasing MPB timber" under the previous system.¹⁸⁷ The United States does not offer a single piece of credible evidence to support this assertion. Ordinarily, if something were a mutually agreed upon condition to the conclusion of a treaty, one would expect to find it in

¹⁸⁵ Neuberger Report ¶¶ 27-28.

¹⁸⁶ Hayden Stmt. ¶ 36 (Ex. R-6).

¹⁸⁷ Stmt. of Case at 25, 53-54; *see also infra* fn. 476, which shows there was no windfall gain under the previous system.

the text of the treaty. The Tribunal will search in vain for *any* reference to the April 2006 log grade changes in the SLA. Nothing in Article XVII or in the remainder of the Agreement makes any reference to the April 2006 changes to the log grading rules.

140. Nor is the evidence relied on by the United States convincing. The United States strains credulity when it claims that “two of the documents specifically identified in Article XXI(35)” support its assertion that “the April 2006 reforms were clearly tied to the language of the SLA.”¹⁸⁸ Those two documents form part of the definition provided in the SLA for MPS. They consist of (1) a paper written by the Ministry that defines Tenure Obligation Adjustments¹⁸⁹ and (2) one that defines the Average Market Price.¹⁹⁰ It is ludicrous to claim that the minor references to log grades in these two Ministry documents somehow constitute proof that the April 2006 reforms were “tied” to and fundamental to the SLA, let alone that they reflect some unstated assurance that the percentage of logs scaled as Grade 4 would remain fixed over time.¹⁹¹

¹⁸⁸ Stmt. of Case ¶ 56. Both these documents were part of a series that B.C. had drafted describing the MPS for the “Definitions” article of the SLA. (The U.S. citations are imprecise however. The first document cited in footnote 73 is not exhibit C-25 and was not included among the exhibits provided by the U.S. The document they apparently intended to cite is Ministry of Forests and Range, *Interior Market Pricing System: Tenure Obligation Adjustments* (June 5, 2006), at CAN-028626 (referencing percentage of old Grade that would be included in new Grades 1 and 2) (Ex. R-126)

¹⁸⁹ Ministry of Forests and Range, *Interior Market Pricing System: Tenure Obligation Adjustments* (June 5, 2006), at CAN-028626 (Ex. R-126).

¹⁹⁰ Ministry of Forests and Range, *Interior Market Pricing System: Average Market Price* (June 5, 2006) (C-25).

¹⁹¹ C-25 (Ministry of Forests and Range, *Interior Market Pricing System: Average Market Price* (June 5, 2006) at CAN-028639).

141. Other than these two documents, the United States cites no documentation, negotiating history or affidavit from any negotiator that suggests that the April 2006 changes were even discussed during the negotiations, much less that they were critical to the deal.

142. Ms. Hayden recalls the contrary. As Deputy Minister in the B.C. Premier's office from 2005 to 2007, with responsibility for monitoring the SLA negotiations, Ms. Hayden was in a position to know what issues were important to those negotiations. She does not recall a single discussion of the April 2006 grading changes. She does recall that grandfathering the MPS system was of critical importance to British Columbia, but she recalls no mention, even in the context of the MPS discussion, of the April 2006 changes.¹⁹²

b. False Premise 2: Lumber Yields Determine Log Grades

143. The United States asserts that, “{a} true decrease in log quality would have resulted in a decrease in the quantity of lumber manufactured from those logs.”¹⁹³ The United States presents no basis for this assertion other than a reference to the Report of Dr. Neuberger. Dr. Neuberger, who is not a forester or lumber mill operator, states that, “if there were a significant decrease in the quality of logs harvested in the BC Interior, I would expect that the quantity of lumber produced from those logs would decline.”¹⁹⁴

¹⁹² Hayden Stmt. ¶¶ 34-35 (Ex. R-6).

¹⁹³ Stmt. of Case ¶ 66.

¹⁹⁴ Neuberger Report ¶ 50 (C-2).

Dr. Neuberger's opinion on this topic appears to be based on the assumption of a direct relationship between the outcomes of the 50/50 test, in terms of log grade, and the outcomes of the lumber production process, in terms of LRF.

144. The United States' inability to define the terms of this assumed relationship belies its existence. Neither the United States nor Dr. Neuberger ever articulates a threshold lumber recovery factor that, if obtained from logs classified as Grade 4, would establish that the logs had been misgraded. The United States does not, for instance, assert that B.C. sawmills recovered more than 50 percent of the volume of Grade 4 logs as lumber. It asks whether lumber recoveries declined along with declining log grades, and concludes that, since they did not, the log grades must have been incorrect. As discussed below, at II.A.2, the United States started with the wrong answer – lumber recovery did decline during the MPB epidemic. But the United States also asked the wrong question. The premise that relative lumber recovery factors offer a reliable metric to assess the accuracy of log grades cannot withstand scrutiny. Indeed, a more thorough understanding of the log grades and how LRF is calculated reveals the theoretical and practical impossibility of using the latter to evaluate the former.

145. As explained in the reports of Professor Kalt and of Darrell Wong and John Taylor, numerous variables affect LRF.¹⁹⁵ Log quality is just one of those variables. Other

¹⁹⁵ Kalt Report ¶¶ 84-88 (Ex. R-9); Wong & Taylor Report [] (Ex. R-12).

important variables include sawmilling technology and operational practices, the product mix being manufactured, and the quality of the lumber being produced. [

] ¹⁹⁶ Thus, if the same mill processes two logs of the same size, one being Grade 4 and one being Grade 2, into the same sized boards of the same quality using the same processes and technology, the volume of lumber recovered from the Grade 2 log would probably exceed the volume recovered from the Grade 4 log. [

] ¹⁹⁷

146. Changes to the size and quality of the boards a sawmill manufactures can, for example, have a significant effect on LRF. Drs. Wong and Taylor explain [

] ¹⁹⁸ Likewise, [

] ¹⁹⁹ Any board that comes out of a sawmill is treated as lumber and its volume is counted in LRF. The quality of the board is

¹⁹⁶ Wong & Taylor Report [] (Ex. R-12).

¹⁹⁷ *Id.*

¹⁹⁸ *Id.* [] (Ex. R-12). []

¹⁹⁹ *Id.*

irrelevant to LRF. [

]



Figure 23: High grade lumber with lumber made from MPB-killed trees

[

] ²⁰⁰ Indeed, a fractured board cut from a checked area of a log can be sold as lumber and will count towards the LRF even though the area of the log from which the fractured portion of the board was cut would not have counted as available for the manufacture of lumber under the Scaling Manual.

²⁰⁰ [] (Ex. R-5).

147. Shifts that favor increased LRF are not just theoretical explanations, they are a predictable response to a reduction in log quality. Drs. Wong and Taylor explain [

] ²⁰¹ Adaptations like these can mitigate or even reverse the LRF losses that might otherwise occur when the quality of logs declines.

148. As discussed below in Section II.A.2.b, Drs. Wong and Taylor also [

] As Professor Kalt explains, “the MPB epidemic has caused the quality of B.C. timber to deteriorate, has resulted in the production of lower-quality and lower-value products from B.C. timber, and has removed significant value from B.C. forests.”²⁰² Log quality declined, and that decline is reflected in the increase in Grade 4 as a percentage of the pine harvest.

²⁰¹ Wong & Taylor Report [] (Ex. R-12).

²⁰² Kalt Report ¶ 81 (Ex. R-9).

2. The Increase in Grade 4 Logs Was Caused by the Mountain Pine Beetle Epidemic

149. At the heart of the United States' inferential case are the assertions, repeated numerous times and in numerous forms, that “{n}othing has occurred since the SLA went into effect that would alter the premises and predictions” about log grades,²⁰³ and that “*the increase in Grade 4 has no relationship to increases in mountain pine beetle damage.*”²⁰⁴ It is important to keep in mind this latter assertion, as we present data and other evidence establishing a direct relationship between the increase in the percentage of Grade 4 timber and increases in Mountain Pine Beetle damage.

150. The United States claim that the increase in the volume of timber classified as Grade 4 must be due to systematic misclassification of Grade 2 logs as Grade 4 ignores the more plausible likelihood – indeed, the reality – that it was the physical characteristics of the logs being measured by the scalers, not the criteria for measuring, that changed during this period. The dramatic spread of the MPB, with its devastating effects on the quality of the B.C. timber supply, resulted directly in an increase in the percentage of logs scaled correctly as Grade 4.

²⁰³ Stmt. of Case ¶ 75; *see also id.* ¶¶ 72, 79.

²⁰⁴ Stmt. of Case ¶ 78 (emphasis added).

151. As Professor Lewis explains in her report, beetle-killed trees begin to deteriorate in quality when they die.²⁰⁵ Log grading takes account of such deterioration in quality. The United States erroneously assumes that, because logs harvested shortly after a tree is killed do not exhibit significant defects, trees killed by the beetles never exhibit significant defects.²⁰⁶ The data and science demonstrate that the increase in the percentage of Grade 4 logs in the pine harvest corresponded with increases in objective measures indicative of deterioration of the pine available for harvest and being harvested.

152. The United States has not shown that a single log classified as Grade 4 after 2006 lacked the physical characteristics that would have made it a Grade 4 log as of July 1, 2006 and it has advanced no causal connection between its speculative assumptions and fact-based evidence. To the contrary, as discussed below, the evidence shows that the physical defects in logs that became increasingly common in MPB-killed timber harvested in the B.C. Interior after 2006, were exactly the types of defects that cause logs to be graded as Grade 4 under B.C.'s grandfathered log scaling system.

a. The Increase in Grade 4 is Consistent with the Increase in Harvested Volumes of Red and Grey Stage Pine

153. Trees that have been attacked and killed by the MPB pass through several stages of visible change in needle color and retention, from “Green Attack” to “Red Stage”

²⁰⁵ Lewis Report ¶¶ 6, 12 (Ex. R-10).

²⁰⁶ Stmt. of Case ¶ 30.

to “Grey Stage.”²⁰⁷ The Ministry collects data concerning the volumes of MPB-killed pine in the Red and Grey Stages that is in stands to be harvested each year in the B.C. Interior. The percentage of harvested pine subject to scaling that was in either Red or Grey Stage increased each year from 2006 through 2009, and the proportion of timber that was grey also increased during that time.²⁰⁸ Indeed, as reflected in the graph below, the percentage of scaled pine classified as Grade 4 increased from 2006 through 2009 at a rate comparable to the increase in the percentage of the pine harvest classified as Red or Grey Stage.²⁰⁹

²⁰⁷ Lewis Report ¶ 30 (Ex. R-10); Snetsinger Stmt. ¶ 20 (Ex. R-7); Ebata Stmt. ¶¶ 18-20 (Ex. R-4).

²⁰⁸ Snetsinger Stmt., App. A.1 (Ex. R-7).

²⁰⁹ Only scaled pine is graded. Beginning in 2008, a small amount of the pine harvest was sold based solely on a “cruise,” which does not require scaling, in preparation for the shift of most of the beetle-affected Interior harvest to move to that system in July 2010. That volume is excluded from this graph.

**Red & Grey and G4 as Percent of Pine Harvest
to 2010 Q2, scale based only**

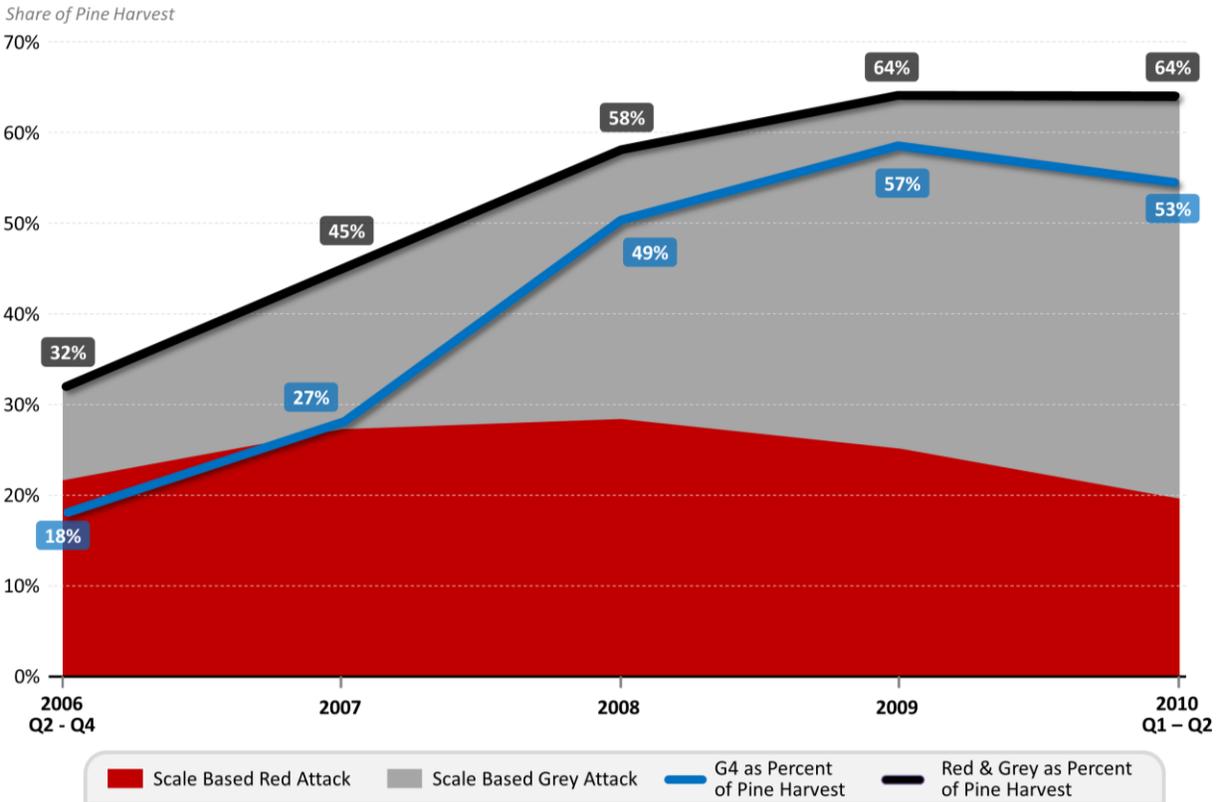


Figure 24: Red and Grey Stage pine and Grade 4 pine as percent of pine harvest (Snetsinger Stmt., App. A.1 (Ex. R-7))

154. As explained by Professor Lewis, the Red and Grey Stages are associated with the passage of time after tree death, so Grey Stage trees will have been dead longer than Red Stage trees. The color change from green to red to grey is associated with loss of moisture. It is this drying process that also causes trees to develop checks.²¹⁰ The frequency and severity of checks increases from early Red Stage, during which pine trees often exhibit no

²¹⁰ Lewis Report ¶¶ 30-31, 56, 82 (Ex. R-10).

checking, to late Red Stage, when checking becomes increasingly common, to Grey Stage, when most trees have developed at least some – and often significant – checking.

155. Pursuant to the grandfathered log grades, the portion of the volume of a log containing checks (plus a standard trim allowance of 2 centimeters around each check) counts as volume not available to manufacture lumber for purposes of the 50/50 test.²¹¹ Since Red Stage pine is likely to exhibit checks and Grey Stage pine is highly likely to exhibit checks,²¹² more checks will tend to mean more (properly classified) Grade 4 logs.²¹³ The increasing share of Grey Stage pine in the harvest would thus be expected to result in an increasing percentage of Grade 4. That is exactly what happened. This relationship belies the United States' assertions that there is no relationship between the increase in Grade 4 and the effects of the mountain pine beetle.

b. The Increase in Grade 4 is Consistent with Timber Being Harvested Increasing Number of Years After Attack

156. The United States asserts that the MPB does not affect the quality of the wood in the trees it kills.²¹⁴ But when the tree dies, the wood commences to deteriorate.

²¹¹ Crover Stmt. ¶ 42 (Ex. R-3); *see supra* ¶¶ 52-61; *see also* [] (Ex. R-2).

²¹² *See* Lewis Report ¶ 57 (Ex. R-10).

²¹³ Crover Stmt. ¶ 44 (Ex. R-3).

²¹⁴ Stmt. of Case ¶ 30.

This is not a rapid process. The most significant degradation of MPB-killed pine trees only begins to manifest itself roughly two years after the death of the tree.²¹⁵

157. Therefore, whether a tree has been dead for more than two years prior to harvest also provides an independent indicator of the likely condition of the wood. Trees harvested more than two years after being killed tend to exhibit defects – particularly checking – that can result in logs from those trees being classified as Grade 4. Professor Lewis explains that, as the number of years between death and harvest increases, the likelihood that an MPB-killed tree will exhibit checks increases, as does the likelihood that those checks will be severe.²¹⁶

158. British Columbia conducts aerial surveys to identify areas under MPB attack and to rank the apparent severity of the attacks.²¹⁷ Areas of Red Stage, particularly, stand out from the air. The data tracking the location and severity of Red Stage can be used to determine the approximate year in which trees in an area were attacked and killed by the MPB. By looking at the harvest records for each area, one can determine how many years after attack those areas were harvested.²¹⁸ The graph below reflects, for each year from 2006

²¹⁵ For a geographic illustration of the cumulative area and severity of the MPB attack from this perspective, *see* Maps Showing Cumulative Percent Pine Killed Two Years Earlier (Ex. R-127).

²¹⁶ *Id.*

²¹⁷ Ebata Stmt. ¶ 26 (Ex. R-4).

²¹⁸ Snetsinger Stmt., App. A at 16 (Ex. R-7).

through 2010, the percentage of pine in the B.C. Interior that was dead at the time of harvest. The graph also indicates the number of years prior to harvest that pine is likely to have been killed. It then compares the percentage of Grade 4 timber in the pine harvest for each year to the approximate age since death of the dead pine stands that were harvested each year.

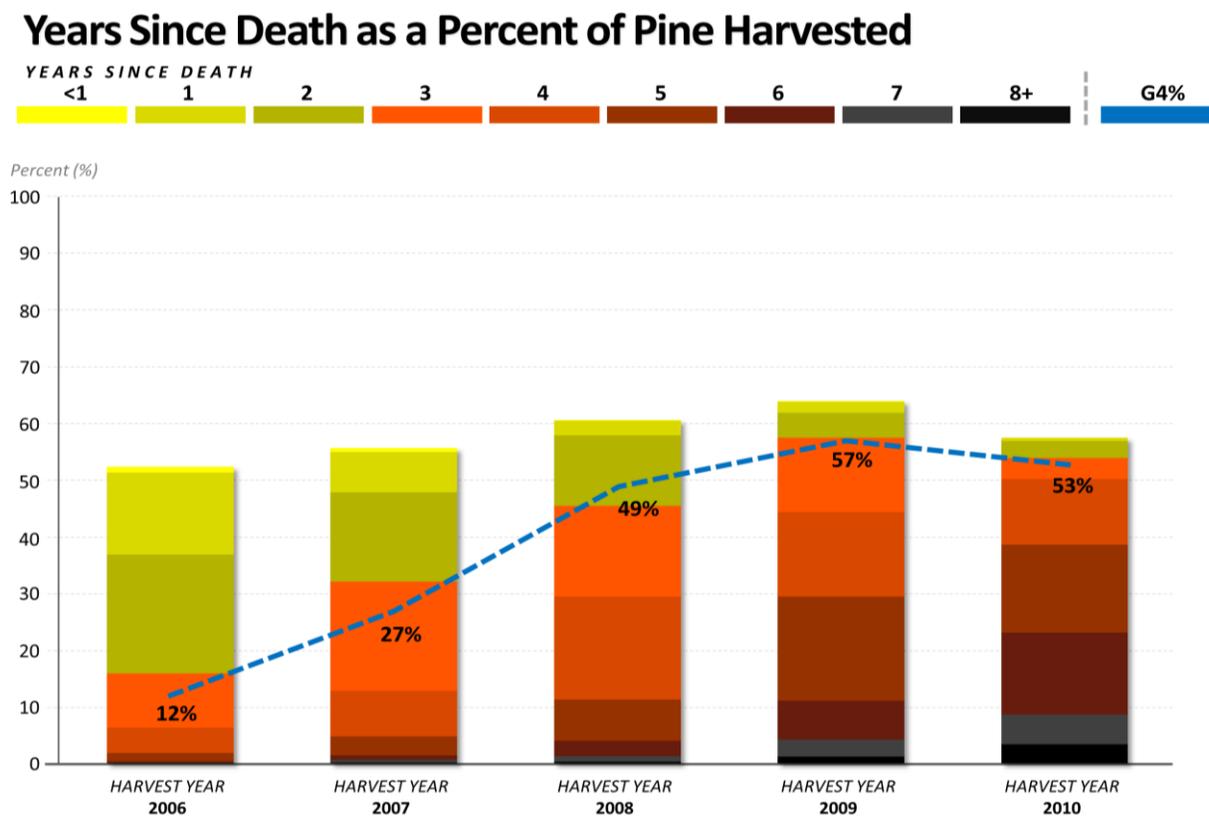


Figure 25: Beetle killed pine as percent of pine harvest, categorized by years since death and compared to Grade 4 as percent of pine harvest

159. This graph illustrates several facts that contradict the U.S. assertions that log quality remained constant as Grade 4 increased. First, although the MPB attack peaked prior to 2006 in terms of new trees killed each year, only a small percentage of the timber harvest

in 2006 was in areas of trees that had been killed more than two years earlier.²¹⁹ Second, because the beetle was killing trees faster than they could be harvested,²²⁰ there is an upward trend over time in the average number of years that pine trees had been dead prior to being harvested. Third, the percentage of the harvest classified as Grade 4 closely tracks the percentage of the harvest that had been killed more than two years earlier. The consistency between increasing years since death – an undeniable indicator of timber deterioration²²¹ – and the increasing share of Grade 4 in the harvest refutes the U.S. assertion that B.C. acted to sever the connection between log grades and log quality.

c. Dr. Neuberger Relies on Flawed Analysis to Dispute that the MPB Explains the Increase in Grade 4

160. The United States relies entirely on the analysis of Dr. Neuberger to challenge the relationship between MPB attack and Grade 4. Dr. Neuberger concludes that “MPB attack does not provide a sufficient explanation for the observed increases in the levels of Grades 4.”²²² He bases that conclusion on his analysis of (1) the percentage of timber classified as Grade 4, harvested from unattacked areas,²²³ and (2) the geographical distribution of Grade 4 levels compared to the geographical distribution of the MPB

²¹⁹ Snetsinger Stmt., App. A at 14 (Ex. R-7).

²²⁰ See *supra* ¶¶ 101-102.

²²¹ See generally Lewis Report ¶¶ 9, 12, 80-86 (Ex. R-10)

²²² Neuberger Report ¶ 38 (C-2).

²²³ Neuberger Report ¶¶ 37-38 (C-2).

attack.²²⁴ Each of these analyses suffers from fundamental flaws that lead to erroneous results. When the flaws are corrected, the results of Dr. Neuberger's analyses in fact support the relationship between MPB attack and the Grade 4 percentage of the pine harvest.

i. The Levels of Grade 4 in Harvested *Pine* of Varying Attack Stages Supports The Relationship Between MPB Attack and Grade 4

161. Dr. Neuberger presents data reflecting the Grade 4 share of timber marks²²⁵ that were classified as: (1) not having been attacked by the MPB; (2) having been attacked, but with fewer than 25 percent of trees in Red or Grey Stage; or (3) having been attacked with more than 50 percent of trees in the Grey Stage.²²⁶ He compares the level of Grade 4 in timber marks showing no MPB attack with the level of Grade 4 in timber marks showing moderate MPB attack, and finds that the share of Grade 4 in the former category exceed the share of Grade 4 in the latter category, and concludes that the MPB attack does not sufficiently explain observed levels of Grade 4 in the Interior harvest.

162. The fundamental flaw in Dr. Neuberger's analysis is that he uses data for *all* tree species, instead of just lodgepole pine.²²⁷ Given that he is purporting to assess whether there is a relationship between the MPB attack, which affects only pine – and the levels of

²²⁴ Neuberger Report ¶ 36 (C-2).

²²⁵ A timber mark is an identifier of timber harvested pursuant to a particular cutting permit.

²²⁶ Neuberger Report ¶ 37 & Table I (C-2).

²²⁷ Kalt Report ¶ 128 (Ex. R-9).

Grade 4 at issue in this case, which are the percentages of Grade 4 in the *pine* harvest – the decision to perform the analysis for all species impeaches the results. One would expect that tree species other than pine would be overrepresented in the “No Attack” category. A more appropriate analysis to test whether there is a relationship between MPB attack and Grade 4 would examine only lodgepole pine.

163. Below is Professor Kalt’s Table 5, a corrected table containing the same Grade 4 share information for the same categories of timber marks as in Dr. Neuberger’s table, but for pine only.²²⁸

Lodgepole Pine Grade 4 Percentage by Quarter								
	2008		2009				2010	
	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
No Attack	10%	8%	7%	5%	4%	4%	2%	2%
MPB 0-25%	9%	9%	10%	10%	11%	11%	10%	10%
MPB 25-50%	21%	22%	26%	28%	31%	31%	32%	33%
MPB over 50%	34%	35%	42%	47%	51%	51%	51%	53%

Figure 26: Professor Kalt’s Table I Grade 4 for lodgepole pine only 2008-2011(percent by Quarter)

As Professor Kalt explains, the breakdown in Dr. Neuberger’s Table I is flawed on several counts:

First, Dr. Neuberger’s data pertain to the entire harvest, not just the pine harvest – i.e., the harvest subject to the effects of the MPB. Since the MPB in the B.C. Interior attacks almost exclusively pine, MPB-attack would not be expected to materially

²²⁸ Consistent with Dr. Neuberger’s approach, this table is based on the attack variable that was added to the AMP equation beginning in the third quarter of 2008. The data took several quarters to normalize.

affect the Grade 4 share of non-pine softwood. Second, timber marks with no MPB attack are relatively uncommon and unrepresentative. As Dr. Neuberger points out, at its highest, this category accounts for only 12 percent of his volumes (of all species), dropping steadily to 3 percent by 2010. Third, his selection of categories is logically inconsistent and excludes portions of the harvest. Specifically, marks with less than 50 percent Grey Attack but more than 25 percent of Grey *plus* Red Attack do not appear in his analysis.²²⁹

Professor Kalt's Table 5 corrects for these errors. With those corrections made, Professor Kalt observes, "The data show a quite consistent pattern in which the Grade 4 percentage of the harvest increases with the level of beetle attack. Once again, the data demonstrate that the level of Grade 4 is related to the severity of the MPB epidemic."²³⁰

ii. The Geographical Variations in Grade 4 are Consistent with the Geographical Variations in the MPB Spread

164. Dr. Neuberger next asserts that the geographical distribution of Grade 4 does not correspond with the geographical spread of the MPB, which he insists demonstrates that the MPB cannot have caused the increase in Grade 4. Dr. Neuberger's methodology, however, is again flawed, and the inferences he draws cannot be sustained. First, Dr. Neuberger has not used the latest available data on MPB attack. Dr. Neuberger uses version 6 of the MPB model estimates on annual volume of attacked pine, published in May 2009. Since then two updates have been published, version 7 in May 2010 and version 8 in

²²⁹ Kalt Report ¶ 128 (Ex. R-9).

²³⁰ *Id.* ¶ 129.

June 2011. Many of the projected results stated in the 2009 report have been updated to reflect actual observations.²³¹

165. Second, the examples Dr. Neuberger relies on to draw his conclusion that there is no observable geographic relationship between the growth in Grade 4 harvest and the regions most heavily hit by the MPB epidemic are poor choices to test his hypothesis that the increase in Grade 4 was not caused by the MPB. The primary problem with Dr. Neuberger's approach is that he relies on the annual district-level figures for pine killed by the beetle, but ignores the cumulative inventory of dead pine and does not look at the relationship between that inventory and what is actually harvested. The year in which a particular region may have suffered peak attack may tell little or nothing about the volume of pine killed before the peak and how much was actually being harvested.

166. Dr. Neuberger's analysis focuses on four districts – Lillooet, Robson Valley, Bulkley and Okanagan. These four districts had low volumes of pine harvest compared with the harvest of other tree species and relative to the volumes of pine harvested in other districts.²³² As in much of the Interior, harvesters in those four districts had access to far more MPB-killed pine than they could possibly utilize. For example, even though Lillooet's

²³¹ For example, the 2009 report projected that the year of maximum kill for the Lillooet TSA would be 2009, but the 2011 report updated the actual year of maximum kill to 2007. Kalt Report ¶ 125 & Ex. R-9K at 8 (Ex. R-9).

²³² Kalt Report ¶¶ 125-126 (Ex. R-9).

year of peak Red Stage is not estimated to have occurred until 2007 (using the latest available information), about 1.5 million cubic metres had been killed in the Lillooet Timber Supply Area (TSA) before that date.²³³ Pine harvest in the Lillooet TSA was only 54,000 cubic metres in 2007, and roughly 20,000 cubic metres or below per year in 2008-2010.²³⁴ Even before the year of maximum attack, the inventory of dead pine available to harvest was enormous compared to the amount of pine that was actually being harvested. Dr. Neuberger's analysis of when the inventory of dead pine peaked thus casts no doubt on the relationship between the effects of the Mountain Pine Beetle and the increase in Grade 4.

167. Professor Kalt analyzes the correlation between the extent of the Red and Grey Attack in a forest district and the amount of Grade 4 in the scale-based harvest over the whole available time period in the data, from April 2006 through June 2011, and for individual years.²³⁵ The analysis shows the following: The correlations across regions are all positive (*i.e.*, when the Red/Grey Attack percentage goes up, the share of Grade 4 goes up) and statistically significant (*i.e.*, we can reject a hypothesis that there is no correlation between the Red and Grey Attack and the share of Grade 4 with very high confidence). In

²³³ Ebata Stmt. ¶ 33 (Ex. R-4).

²³⁴ This compares to Interior-wide pine harvest of 25 million cubic metres.

²³⁵ Kalt Report ¶ 121.

short, it is clear that, looking across regions and across time, the Grade 4 share of the pine harvest is strongly correlated with the MPB attack.²³⁶

d. Statistical Analysis Confirms that Factors Related to the Physical Characteristics of Logs Explain the Levels of Grade 4

168. The fact that every available indicator of the quality of harvested timber – the increase in harvest of MPB-killed pine, the attack stage of harvested pine, the increasing years since death at the time of harvest – demonstrate a correlation with the increase in the percentage of Grade 4 is enough to refute the inferential case advanced by the United States. Dr. Neuberger, however, has undertaken a statistical analysis that he characterizes as undermining the existence of a causal relationship between the MPB epidemic and the increase in Grade 4. Professor Kalt sets forth in detail the methodological deficiencies in Dr. Neuberger’s analysis. As Professor Kalt explains, Dr. Neuberger ignores real-world physical indicators that correlate with log quality, and instead constructs a time trend based on assumptions that could fairly be characterized as arbitrary.²³⁷

169. Professor Kalt, however, has gone further than pointing out the flaws in Dr. Neuberger’s analysis. He has performed his own regression analysis using data relevant to log quality to determine whether those data explain the levels of Grade 4. Professor

²³⁶ *Id.* at ¶123.

²³⁷ *Id.* ¶ 140 (Ex. R-9).

Kalt's findings confirm what the analysis of each objective measure of log quality demonstrates: the increasing levels of Grade 4 are explained by deteriorating log quality, not by misgrading.²³⁸

170. As Professor Kalt reports, he performed a statistical regression analysis of the monthly share of the pine harvest accounted for by Grade 4 timber.²³⁹ Professor Kalt initially used the three relevant economic variables that other information and sources indicated were the primary determinants of the growth in Grade 4, namely:

- the estimated percent of the month's harvest that is from Red Stage;
- the estimated percent of the month's harvest that is from Grey Stage; and
- the average temperature for the month (the ability to observe checking varies with temperature and season).

171. Professor Kalt concludes that these three variables explain reasonably well the large monthly movements and trends in the Grade 4 share.²⁴⁰ Despite using fewer variables than Dr. Neuberger, the three variables in Professor Kalt's regression analysis do a better job in explaining the monthly Grade 4 shares than does Dr. Neuberger's regression "test." The

²³⁸ *Id.* ¶¶ 146-149 (Ex. R-9).

²³⁹ *Id.* ¶ 146 (Ex. R-9).

²⁴⁰ *Id.* ¶ 147. Professor Kalt "examined the additional contribution of kiln warming to the regression. The identified effect is numerically small and statistically significant. The key results are unaffected by inclusion of the variable." *Id.* ¶ 146 n.157.

compelling conclusion is that the monthly Grade 4 share is statistically explained by these factors in a manner that is consistent with the facts, science, and data presented by Professors Kalt and Lewis, Dr. Oliveira, and the several fact witnesses.

3. Lumber Recovery and Lumber Grade Data Contradict the U.S. Claim that Logs Were Misclassified as Grade 4

172. The United States asserts that “a significant increase in Grade 4 timber, if BC were grading the timber correctly, would necessarily result in a corresponding, measurable, and likely substantial decrease in either the quantity or quality of lumber produced in BC.”²⁴¹ According to the United States, however, “the data on timber harvest and lumber production in the BC Interior for this period demonstrate exactly the opposite.”²⁴² Once again, the United States’ *only* support for this conclusion is the testimony of Dr. Neuberger, which it paraphrases without any elaboration.²⁴³ As shown below, however, Dr. Neuberger either misinterprets or ignores the relevant data on “timber harvest and lumber production.” Those data, when properly analyzed, contradict each of the conclusions he draws.

²⁴¹ Stmt. of Case ¶ 63.

²⁴² *Id.*

²⁴³ Stmt. of Case ¶¶ 64-68.

a. **Both the Quality and Quantity of Lumber Produced in the B.C. Interior Declined as Grade 4 Increased**

173. Dr. Neuberger argues that, if the increase in the percentage of timber graded as Grade 4 had been caused by the effects of the MPB, rather than by misgrading, there would have been a “corresponding decrease in the quantity or value of lumber being produced from BC Interior timber.”²⁴⁴ After analyzing “several sources” of allegedly “relevant information,” he concludes that the data provide no evidence of the *expected* decrease in the quantity or value of lumber produced in the B.C. Interior.²⁴⁵ On this basis, Dr. Neuberger concludes that the increase in Grade 4 must be due to misgrading. Putting aside Dr. Neuberger’s erroneous assumption of a direct relationship between log grades and lumber output, the data refute his conclusions. In fact, contrary to Dr. Neuberger’s assertions, both the quantity and value of lumber produced in the B.C. Interior have been adversely affected as increasing volumes of MPB-killed logs were processed by Interior sawmills over the relevant period.

174. Dr. Neuberger expends considerable effort examining various lumber pricing data in an effort to test his hypothesis that an increase in the percentage of Grade 4 pine in the Interior should have been accompanied by an increase in the output of “low-grade, non-merchantable lumber,” and a corresponding decline in the output of “standard,

²⁴⁴ Neuberger Report ¶ 46 (C-2).

²⁴⁵ *Id.*

merchantable lumber.”²⁴⁶ Based on his analyses of these pricing data, he concludes that no such shift towards lower-quality lumber output occurred. What Dr. Neuberger failed to realize is that there is a wealth of data that permits his proposition to be tested. This testing can be done *directly*, by reference to actual B.C. Interior lumber *output* data, rather than *indirectly*, by reference to the lumber *pricing* data he examined. The Ministry routinely collects output data, by lumber grade, for the Spruce-Pine-Fir (“SPF”) lumber produced by a large and representative sample of the Interior’s softwood lumber producers.²⁴⁷ The Ministry specifically asks those producers to break their data out into four lumber grades: (1) #2 & Btr (two and better), (2) studs, (3) # 3 utility, and (4) economy. The latter two categories coincide with what Dr. Neuberger calls “low-grade, non-merchantable” lumber, while the first two reflect what he refers to as the “standard merchantable” grades. These data allow a direct examination of the trends in Interior lumber grade output over time, and are thus the best evidence available to test Dr. Neuberger’s hypothesis.

175. As the next two graphs show, these data unambiguously refute Dr. Neuberger’s conclusion that there has been no shift in the relative shares of “low-grade, non-merchantable” and “standard merchantable” lumber produced in the B.C. Interior over the relevant period. Figure 27 below shows that low- grade lumber – the economy and

²⁴⁶ Neuberger Report ¶ 48.

²⁴⁷ “Spruce-Pine-Fir” is the dominant lumber species manufactured in the B.C. Interior, and refers to three timber species of similar characteristics that have been grouped together for production and marketing purposes.

utility grades – has been accounting for an ever-increasing share of SPF lumber sales since 2005, while the share represented by the highest-quality grade – # 2 & Btr – has declined substantially, from 71 percent in 2005 to only 58 percent in 2010.²⁴⁸

Percent of Lumber Volume by Lumber Grade

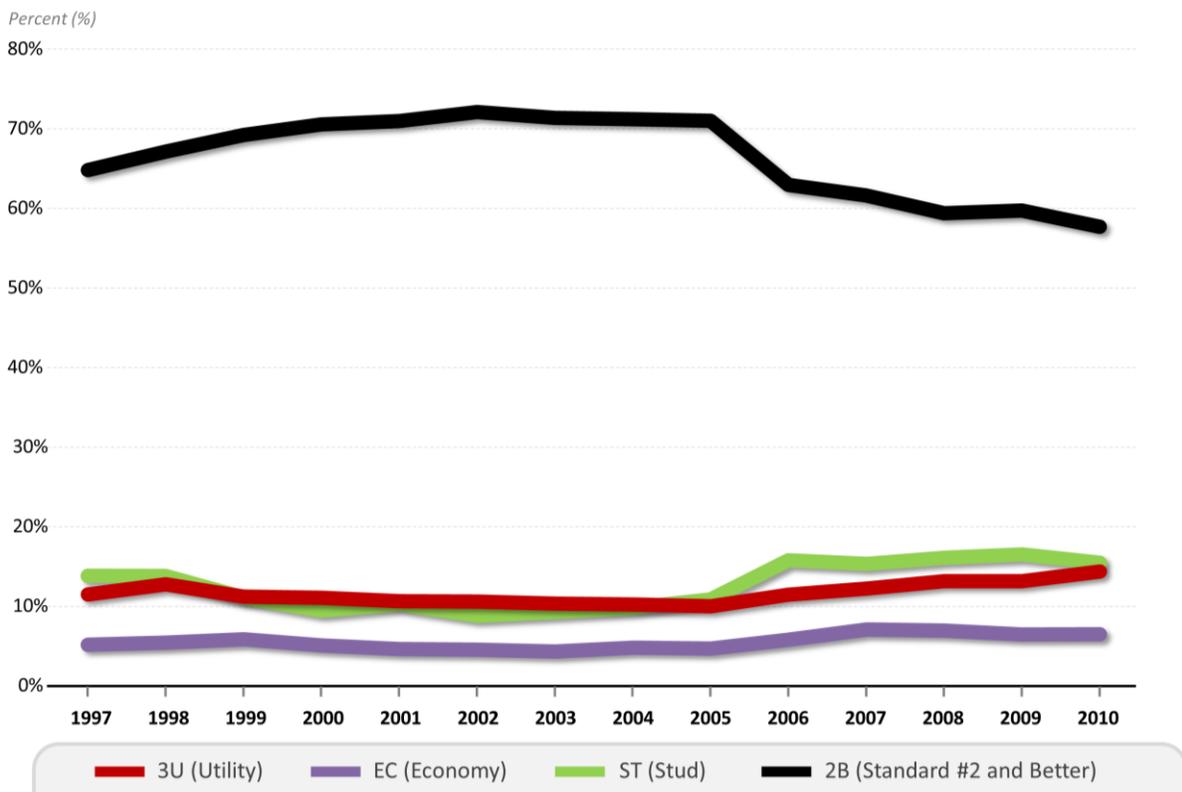


Figure 27: Percent of lumber volume by lumber grade (Kalt Report, Figure 9)

²⁴⁸ Kalt Report ¶¶ 75-81, Figures 9, 10 (Ex. R-9).

176. Figure 28 aggregates the same information reflected above into the two broader “merchantable” (standard #2 and Better and studs)²⁴⁹ and “non-merchantable” (utility and economy) lumber grade categories Dr. Neuberger identifies.

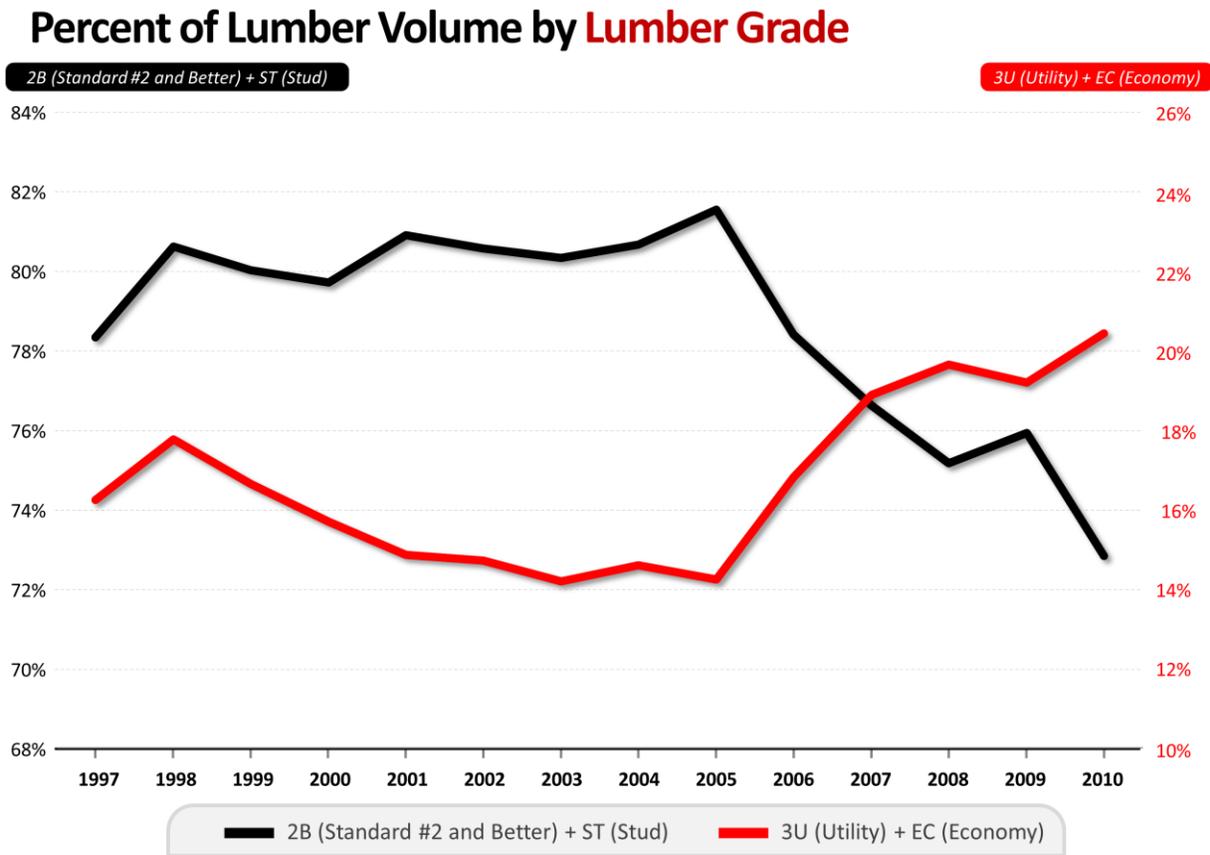


Figure 28: Percent of lumber volume by lumber grade (standard #2 & Btr and Stud)
(Kalt Report, Figure 10)

²⁴⁹ The Scaling Manual defines “Merchantable lumber” as “good, strong, general purpose lumber graded as better than utility or number 3, and not less than 2.5m long (this is assessed on the basis of knots and twist).” Scaling Manual (June 30, 2006), Glossary of Terms at G-8 (Ex. R-19).

177. As Figure 29 reflects, after peaking in 2005 at near 82 percent of sales, the share of “merchantable” lumber declined to 73 percent by 2010. Over the same period, the share of non-merchantable lumber rose from 14 percent to 20 percent. In sum, the available relevant data contradict Dr. Neuberger’s conclusion that there has been no deterioration in the quality of lumber produced in the B.C. Interior over the relevant period. There clearly has been.²⁵⁰ Tangible evidence of this shift to the production of lower quality lumber can be seen in the dramatic increase in the volume of lumber exported to China in recent years. Exports of B.C. SPF lumber to China essentially doubled each year between 2006 and 2010.

178. Dr. Neuberger gives little weight to the emergence in China of a market for the lower quality lumber that mills were producing.²⁵¹ [

] ²⁵² Indeed, many mills would have been forced to shut down. [

²⁵⁰ The existence of the lumber grade output data discussed above renders it unnecessary for Canada or the Tribunal to address Dr. Neuberger’s various lumber pricing analyses set forth in paragraphs 47-49 and 51 of his report, and the accompanying exhibits thereto (Exhibits 7, 8, 8a and 10). By his own acknowledgment, those analyses were a *surrogate* for an analysis of the direct evidence he mistakenly believed did not exist. In any event, as Professor Kalt explains, the analyses merely confirm that the uninformed assumptions underlying his inferential conclusions are invalid. Professor Kalt then proceeds to correct the analysis and show that the facts support the clear relationship between MPB and Grade 4. *See e.g.*, Kalt Report ¶¶ 107, 135 (Ex. R-9).

²⁵¹ Neuberger Report ¶ 49 and App. C (C-2).

²⁵² [(Ex. R-5).

] ²⁵³ There simply was no market in North America for such large quantities of low-grade lumber. [

] ²⁵⁴ That is why the B.C. Government has worked to develop “a market in China that would make it economic for our industry to harvest and utilize dead pine.²⁵⁵

179. [

] ²⁵⁶ [

] ²⁵⁷

²⁵³ [] (Ex. R-5).

²⁵⁴ *Id.* []

²⁵⁵ Hayden Stmt. ¶ 30 (Ex. R-6).

²⁵⁶ Wong & Taylor Report [] (Ex. R-12); [] (Ex. R-5).

²⁵⁷ Kalt Report [] (Ex. R-9).

A similar premium product is the so-called “home centre” or “square edge” grade, which is sold for consumer applications in Home Depot, Lowes and other “do-it-yourself” outlets, and which also sells for a premium over #2 & Btr product. [

] ²⁵⁸ [

] ²⁵⁹

180. As a result, a portion of the #2 and Btr lumber produced in the B.C. Interior since the industry began milling substantial volumes of MPB-killed logs has been pushed to the lower bound of that grade specification. As [

] ²⁶⁰

Dr. Neuberger ignores entirely this tangible loss in quality and value associated with the MPB outbreak.

181. Dr. Neuberger’s analyses of trends in Interior lumber volume production to conclude that log quality did not decline as Grade 4 increased is no more persuasive than his

²⁵⁸ [] (Ex. R-2).

²⁵⁹ Kalt Report ¶¶ 89, [] (Ex. R-9).

²⁶⁰ [] (Ex. R-5).

flawed analysis of lumber quality trends. As a surrogate for LRF, Dr. Neuberger examines the ratio of lumber production to harvest volume between 2006 and 2010, and concludes that, because this ratio did not decline, it follows that log quality could not have declined either.²⁶¹ Here again, it is instructive to examine the *actual* LRF data collected by the B.C. Ministry of Forests. While LRFs did remain relatively stable over this period, Dr. Neuberger's analysis failed to take into account two important considerations. First, as the graph below shows, between 1991 and 2005, LRFs in the B.C. Interior increased consistently every year.²⁶²

²⁶¹ Neuberger Report ¶ 50, Exhibit 9 and App. D (C-2).

²⁶² Kalt Report ¶ 85, Fig. 14 (Ex. R-9).

Lumber Recovery Factor (1991-2009): Actual v. Long-Term Trend

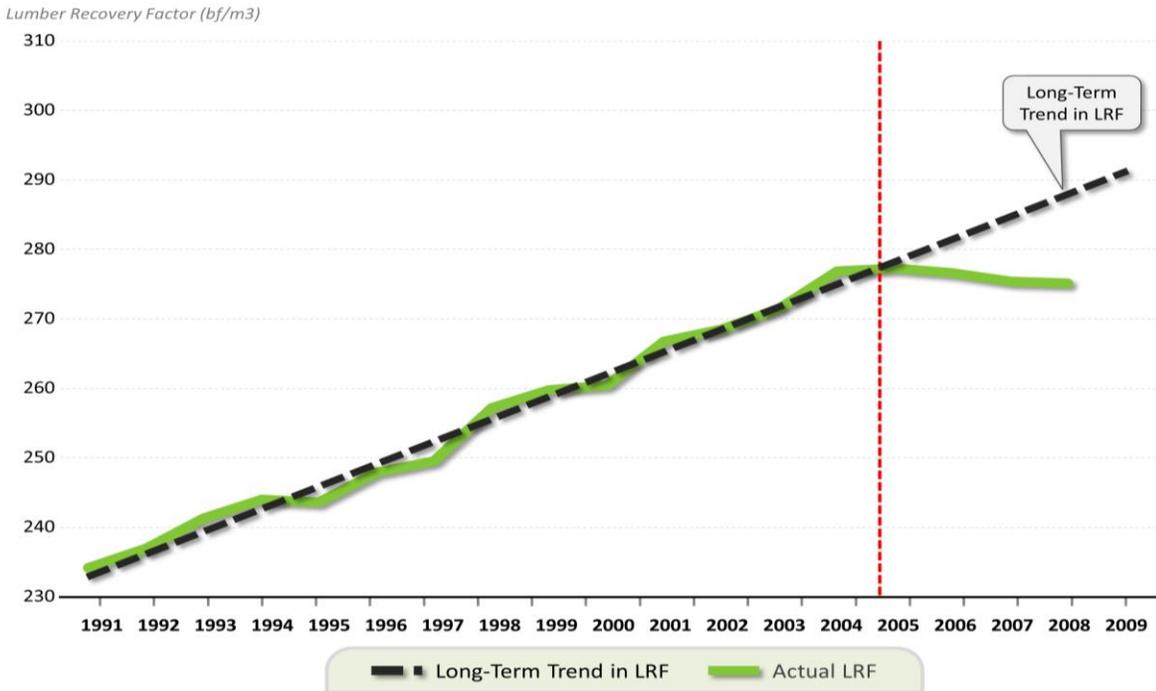


Figure 29: Lumber recovery factor (LRF) – 1991 to 2009: actual v. long-term trend (Kalt Report, Figure 14)

182. In 2005, that 14-year steady upward progression abruptly ceased, at the same time as the shift to milling larger and larger quantities of MPB-killed logs. The relatively stable LRFs observed in 2006 and beyond must be considered in the light of that historical context. Comparing the actual year-to-year aggregate LRFs after 2005 with the long-term trend line calculated by Dr. Kalt by itself suggests a dramatic decline in variables that correlate with LRF. [

] ²⁶³ But LRFs did not increase. This is because all else was not equal. As reflected in the share of Grade 4 in the harvest, log quality declined.²⁶⁴

183. Thus, contrary to Dr. Neuberger’s simplistic premise that log quality was the *only* factor that might have influenced LRFs over this period, [

] ²⁶⁵ [

] and in the expert report of Drs. Wong and Taylor.²⁶⁶ [

] ²⁶⁷

184. The overall conclusion drawn by Dr. Neuberger from his analysis of lumber quality and production trends is “that there has been no decline in the quality of BC timber

²⁶³ Wong & Taylor Report [] (Ex. R-12).

²⁶⁴ Kalt Report ¶ 106 (Ex. R-9).

²⁶⁵ [] (Ex. R-2).

²⁶⁶ [] (Ex. R-2); [] (Ex. R-5); Wong & Taylor Report [] (Ex. R-12).

²⁶⁷ [] (Ex. R-2); [] (Ex. R-5); Kalt Report ¶¶ 106-107 (Ex. R-9).

that reduced its market value.”²⁶⁸ Had there been such a decline, Dr. Neuberger acknowledged that the “increase in the amount of Grade 4 logs might have reflected market conditions.”²⁶⁹ The foregoing analysis shows that there was indeed a decline in the value of B.C. timber caused by the MPB attack, as measured by the same two benchmarks Dr. Neuberger analyzes: lumber quality and lumber output.

185. Professor Kalt has gone one step further, and provided a detailed estimate of the overall loss in lumber revenue to B.C. lumber producers due to the decline in lumber output and quality associated with milling MPB-killed logs over the relevant period.

According to Professor Kalt, the combined value loss due to the MPB outbreak since 2005 is in excess of C \$414 million.²⁷⁰ As Professor Kalt explains, this is a conservative estimate because he lacks the data to estimate the “within-grade” value loss due to fewer sales of J-Grade and other premium products within the broad #2 & better category.²⁷¹

186. The relevant data thus show precisely the diminution in lumber output and quality that Dr. Neuberger says he would have expected to accompany the increase in the percentage of Grade 4 timber had that timber been accurately graded. If any inference is to be drawn, therefore, it is not one of misgrading but of proper grading.

²⁶⁸ Neuberger Report ¶ 17 (C-2).

²⁶⁹ *Id.*

²⁷⁰ Kalt Report ¶ 96 (Ex. R-9).

²⁷¹ *Id.* ¶¶ 93-95.

b. Technological Advances and Investments Permitted Mills to Recover More Lumber from Dead, Dry Logs

187. In attempting to draw conclusions about log quality from lumber output data, the United States and Dr. Neuberger assume that all the numerous variables other than log quality that might affect lumber outputs remained stable. In so doing, both ignore one of the most significant variables affecting lumber outputs – mill technology. As explained in detail in the expert report of Drs. Wong and Taylor, [

] ²⁷²

188. The effects of mill technology manifest themselves in two ways. First, substantial investments in technology were made by B.C. Interior sawmills. [

] ²⁷³ [

] are described in the joint expert report of Darrell Wong and John Taylor. Their aggregate analysis is corroborated by the

²⁷² Wong & Taylor Report [] (Ex. R-12).

²⁷³ Wong & Taylor Report [] (Ex. R-12).

]²⁷⁴

189. Second, the closure of many inefficient mills in the Interior in recent years also mitigates the decline in LRFs over time. [

]²⁷⁶ As a result, only the more efficient and productive mills that could adapt to this fundamental shift in fibre supply remained open. The aggregate lumber recoveries in the Interior reflect this commercial reality.

c. The Shift in Consumption of Grade 4 Logs from Sawmills to Pulpmills Rebuts the Inference of Misgrading

190. Dr. Neuberger’s final argument in support of the proposition that there was no decline in log quality over the period that the percentage of Grade 4 increased is another instance where his conclusion rests on an examination of the wrong data. According to

²⁷⁴ [] (Ex. R-2); [] (Ex. R-5); *see also* View From the Top: Kayne Takes Charge at Canfor, Logging and Sawmill Journal, May-June 2011 (quoting CEO to Canfor, Canada’s second largest lumber producer, as stating “we’re spending a good chunk of the capital at the sawmills” on “optimization” to adapt to beetle-killed wood.) (Ex. R-125).

²⁷⁵ [] (Ex. R-2).

²⁷⁶ *Id.*

Dr. Neuberger, if there had been a legitimate increase in the percentage of Grade 4 logs, there would have been a decrease in the share of logs going to sawmills “as lower quality logs were sent to other uses, such as pulp mills.”²⁷⁷ Dr. Neuberger purports to find data that “show exactly the opposite occurring,” and on that basis, concludes that the increase in Grade 4 must have been the result of misgrading.²⁷⁸ Once again, his conclusion is contradicted by data routinely collected by the B.C. Ministry of Forests.

191. Dr. Neuberger bases his conclusion that the share of logs going to sawmills increased over the relevant period contrary to his expectation on log usage reports from the B.C. Interior Log Market Reports. In a footnote to his conclusion, Dr. Neuberger acknowledges that these reports, “only include logs that were sold to mills in arms-length transactions and thus *exclude most logs harvested in the B.C. Interior.*”²⁷⁹ He goes on to say, “*for that reason, I have not used these data in my analyses.*”²⁸⁰ After this unambiguous recognition of the limited utility of the Log Market Report data, Dr. Neuberger inexplicably “uses” precisely these same data in his “analyses” of log usage trends. Putting aside this contradiction, data that *includes* most logs harvested in the B.C. Interior is publicly available, and an examination of that data contradicts Dr. Neuberger’s conclusions.

²⁷⁷ Neuberger Report ¶ 52, n.45 (C-2).

²⁷⁸ *Id.*

²⁷⁹ Neuberger Report ¶ 45 (C-2) (emphasis added).

²⁸⁰ *Id.* (emphasis added).

192. As the table below shows, the share of logs going to sawmills declined from 85 percent in 2005 to 80 percent in 2009, while the share of logs going to pulp mills and chip mills increased from 3 percent to 6 percent over the same period.²⁸¹ These data contradict Dr. Neuberger’s assertion that the share of logs going to non-sawmill uses did not increase as Grade 4 volumes increased. Rather, the data show the market behaving exactly as Dr. Neuberger says it should have behaved if Grade 4 timber were properly graded.

Year	Logs, All Uses	Logs to Lumber Mills		Logs to Pulp/Chip Mills	
		(000) m ³	(000) m ³	% ratio	(000) m ³
2004	58,013	49,030	84.52%	1,455	2.51%
2005	61,101	51,901	84.94%	2,095	3.43%
2006	60,970	51,542	84.54%	2,152	3.53%
2007	57,363	48,185	84.00%	2,180	3.80%
2008	43,049	35,471	82.40%	2,237	5.20%
2009	35,102	28,189	80.31%	2,125	6.05%

Figure 30: Share of logs going to sawmills (2004-2009)
Source: Major Primary Timber Processing Facilities in British Columbia,
 Annual Reports 2004-2009, B.C. Ministry of Forests

4. The Studies Relied Upon by the United States Do Not Support the Inference that Logs Were Misclassified as Grade 4

193. The United States and Dr. Neuberger place great weight on four mill studies examining lumber recovery at four mills, each of which processed two sample loads of logs,

²⁸¹ B.C. Ministry of Forests, Lands and Natural Resource Operations, *Major Primary Timber Processing Facilities in British Columbia 2004-2009* (2006-2011) (in these annual reports, see Figure 1).

one Grey Stage sample and one green, or unattacked, sample. It is apparent, however, that neither the United States nor Dr. Neuberger has figured out whether to embrace the studies as rigorous and representative or to dismiss them as deficient and unreliable. They have, rather, attempted to rely selectively on some of the studies' methodologies and conclusions, while giving a wide berth to others. The most striking example of this selective reliance is the fact that the United States simultaneously asserts that (1) that the lumber recoveries from samples that included Grade 4 logs in the mill studies corroborate misgrading in the Interior²⁸² and (2) that the grading in the mill studies themselves was incorrect.²⁸³

194. The United States' confusion about how to use the mill studies to support its allegations of misgrading can be attributed to the fact that the mill studies do not support their allegations. There are three reasons that the mill studies fail to offer any support for the U.S. allegations that Grade 2 logs were misclassified as Grade 4.

195. First, as emphasized in the study reports themselves and as explained by Dr. John Taylor, [

²⁸² Stmt. of Case ¶ 92.

²⁸³ Neuberger Report ¶ 42 (C-2).

] ²⁸⁴ [

] ²⁸⁵ [

] ²⁸⁶ Moreover, although the logs in the grey samples were characterized by the study reports as having been harvested more than five years after death, Dr. Lewis doubts that they had been dead that long.²⁸⁷ These non-representative characteristics of the mills and the logs that they processed make it difficult to generalize the results to the Interior, and neither the United States nor Dr. Neuberger has made any effort to establish that such a generalization would be sound.

196. Second, the U.S. reliance on the mill studies' lumber recovery results as evidence of misgrading depends on the erroneous premise (discussed above) that lumber recovery results provide evidence of the correct log grade. According to the United States,

²⁸⁴ Wong & Taylor Report [] (Ex. R-12).

²⁸⁵ Wong & Taylor Report [] (Ex. R-12); C-5 (Comparison of Lumber Recovery and Value Yields from Green Lodgepole Pine Logs and Grey Stage (5+ years) MPB Attacked Logs, Part 3, Princeton Sawmill (Dec. 2008) at 20-21).

²⁸⁶ Wong & Taylor Report [] (Ex. R-12).

²⁸⁷ Lewis Report ¶ 93 (Ex. R-10).

the mill studies generally show that, in the four mills processing these particular samples into the lumber that they chose to produce, volume and value recovery declined moderately when the mills processed Grey Stage timber rather than green timber.²⁸⁸ Assuming, for the sake of argument, that the mills were typical of those in the Interior (they were not), that the samples were representative of the Interior harvest profile (they were not), that the products manufactured were consistent with what mills would be expected to produce (they were not), and that the loss in recovery observed was only moderate (it was not), the only conclusion that one can draw from the U.S. interpretation of these studies is that recovery from a sample of MPB-killed pine with roughly 35 percent Grade 4 will be at least moderately worse than from green wood. This decline in lumber recovery is relevant to timber grading only if one assumes a direct relationship between timber grade and lumber recovery, which, for all of the reasons discussed above, does not exist and should not be expected.

197. Finally, the United States and Dr. Neuberger mischaracterize the observed decline in relative lumber volume and value recovery between green and grey samples in the four studies as a “small reduction”²⁸⁹ and as “relatively small.”²⁹⁰ The table below from the report on the Princeton study – the last of the four – captures the combined losses observed

²⁸⁸ Stmt. of Case ¶¶ 91-92, 94.

²⁸⁹ Stmt. of Case ¶ 91.

²⁹⁰ Neuberger Report ¶ 44 (C-2).

when switching from green to grey samples in each of the mills tested. In no industry would losses ranging from 15.6 percent to 29 percent be considered minor or inconsequential.

Table 8: Comparison of lumber recovery and value losses for the four mill trials

Mill	Total LRF loss	Lumber value loss	Combined loss
Princeton	1.5%	14.1%	15.6%
Quesnel	7.1%	23.5%	29.0%
Prince George	8.2%	11.9%	19.0%
Vanderhoof	12.5%	5.7%	17.5%

Figure 31: Comparison of lumber recovery and value losses for the four mill trials

198. The United States insists that the only figure that matters in determining whether logs were correctly graded is the decline in LRF, or lumber volume recovery, and that declines in lumber value do not matter.²⁹¹ [

]²⁹² One mill might choose to focus on recovering a few high-grade, high-value boards from a log, while another might instead process the same log into a large number of low-grade, low-value boards. In the latter instance, the lumber recovery will be higher, but the value would be the same or lower. Indeed, the above results suggest just these types of variations that affect lumber recovery, but that have nothing to do with the quality of the logs. The fact is that Grey Stage beetle-killed logs in these mill studies yielded less lumber and lower quality lumber than the green logs. As Canada has explained,

²⁹¹ Stmt. of Case ¶ 92.

²⁹² See Wong & Taylor Report [] (Ex. R-12).

that fact says very little about how those logs should have been graded. But even if it were correct that log grades should predict lumber outputs, there is nothing about these studies that would suggest that these lumber outputs are inconsistent with accurate log grading either in these studies or throughout the Interior.

B. THE UNITED STATES' "ACTIONS" CASE FAILS

199. Forty-six pages into the Statement of Case, the United States finally alleges that British Columbia made four “changes” to its log grading system that the United States claims amount to actions that circumvented the SLA. These are: (1) encouragement of the use of local knowledge; (2) encouragement of the practice of bucking; (3) the Scaling Requirements that were incorporated into the Scaling Manual of 2008; and (4) kiln re-drying. In focusing on these alleged changes to British Columbia’s system, the United States at least appears to recognize that it must establish a government action as the first element of a case of circumvention. However, even here, it has failed to establish the elements necessary for the Tribunal to find that Canada has circumvented the Agreement in connection with any of these so-called changes.

200. The persistent theme running through the U.S. allegations is that B.C.’s actions constituted abandonment of the 50/50 rule.²⁹³ Yet everything the United States

²⁹³ Stmt. of Case ¶ 96.

describes – including the e-mail communications by Ministry staff that could not possibly rise to the level of “actions” under the SLA²⁹⁴ – reflected a conscientious effort to accurately and consistently apply the 50/50 rule. This section will address each of the so-called actions identified by the United States and will show that the United States fails to demonstrate the elements necessary to establish a circumvention claim as to any of them. Rather, the actions that B.C. has taken promoted the accurate and consistent application of the 50/50 rule.

1. No Circumvention Can Be Found Based on Two Communications from Ministry Staff Concerning Grandfathered Practices

a. The Use of “Local Knowledge”

201. The first so-called “change” that the United States identifies as an action amounting to circumvention is an e-mail sent by Steve Laberge, a member of the Ministry’s scaling staff, encouraging the collection and assessment of “local knowledge” with regard to checks in logs.²⁹⁵ The United States admits that B.C.’s grandfathered timber pricing and Scaling Regime incorporated the use of “local knowledge,” but claims that the Ministry’s e-mail resulted in more logs being graded as Grade 4, and that Mr. Laberge’s e-mail must, in

²⁹⁴ *Id.*

²⁹⁵ Stmt. of Case ¶ 100 (citing C-45 (E-mail from Steve Laberge (Feb. 2, 2007) at CAN-010975)).

some inexplicable way, have constituted a circumvention of the Agreement.²⁹⁶ The United States has not offered any evidence that this e-mail resulted in the use of such local knowledge or that it had any effect on the volume of Grade 4, much less that it led to a misgrading of logs. Instead, the United States has seized on this inconsequential February 2007 e-mail, not because of its substance or effect, but because it happens to have been sent around the time that Grade 4 percentages were increasing. The e-mail thus gives the United States an aspirational hook on which to hang an early commencement date for the circumvention that it imagines to have occurred.

202. Local knowledge is a shorthand for the accumulation of evidence about, and experience with, log characteristics at the local level, which may not be captured in province-wide scaling regulations and conventions.²⁹⁷ Such knowledge, based on repeated and consistent recorded observations, enables a scaler to employ his or her experience with actual conditions to inform application of the existing scaling rules to achieve a more accurate scale.²⁹⁸ Local knowledge is used and encouraged in most scaling systems, including

²⁹⁶ See Stmt. of Case ¶ 103 (alleging a breach of the SLA because the “concurrent rise in timber classified as Grade 4” in the year following the e-mail “demonstrates that the Ministry’s increased use of local knowledge in scaling diverted more timber into Grade 4.”)

²⁹⁷ See Scaling Manual (June 30, 2006) § 5.1.4 at 5-4 (noting that “{a}n accurate scale will best be achieved when scalers temper the use of conventions with local knowledge and sound judgment.”) (Ex. R-19).

²⁹⁸ See Scaling Manual (effective June 30, 2006) § 5.1.4 at 5-4 (“Scalers must always be able to clearly demonstrate the basis for their scale. Significant departures from established conventions should be discussed and agreed to by the local district scaling supervisor or check scaler before they are employed.”) (Ex. R-19); see also Crover Stmt. ¶ 79 (Ex. R-3).

many in the United States. The United States Forest Service, for example, describes scaling “as an art founded on applying specific rules in a consistent manner based on experienced judgment as to how serious certain external indicators of defect are in a specific locality.”²⁹⁹ Local knowledge is distinct from “local practice,”³⁰⁰ which is a term used to describe regional inconsistency in the interpretation of scaling rules, something the Ministry actively discouraged. The United States blurs the important distinction between local knowledge and “local practice” in its Statement of Case³⁰¹

i. The United States has not Identified an “Action”

203. The United States describes Mr. Laberge’s e-mail as a “directive.”³⁰² This is a mischaracterization. The e-mail was simply a suggestion by Mr. Laberge that scalers gather information on checks so that “{they could understand} the behavior of checks under different weather conditions.”³⁰³ The United States advances no evidence to show scaling

²⁹⁹ See, e.g., United States Department of Agriculture, United States Forest Service, *National Forest Log Scaling Handbook* (FSH 2490.11) at 10-2 (Ex. R-128).

³⁰⁰ Crover Stmt. ¶ 81 (Ex. R-3).

³⁰¹ Stmt. of Case ¶ 101. For example, the United States conflates the two concepts when it cites a December 1, 2007 presentation by the Ministry entitled “Presentation of Requirements and Convention For Checked Logs.” (See C-84.) The specific presentation slide referred to by the United States to support its argument, notes: “Difficulties in the measurement of checks (depth & length),” and “Local grading applications contrary to policy (*i.e.* 10 cm circle or disk).” (See C-84 at CAN-010279.) The reference to the “10 cm circle or disk” application, is a reference to a practice otherwise known as the “hockey puck” rule, used by some scalers to determine whether there was sufficient area on the log to manufacture lumber, and which was actively discouraged by the Ministry and superseded by the 2007 Scaling Requirements discussed below.

³⁰² Stmt. of Case ¶ 101.

³⁰³ C-45 (E-mail from Steve Laberge (Feb. 2, 2007) at CAN-010975).

decisions were altered as a result of the February 2007 e-mail. Nor does the United States point to any specific use of local knowledge.³⁰⁴ Indeed, as explained in the Witness Statement of James Crover, Mr. Laberge’s supervisor at that time, the suggestion or encouragement had no effect as it was not acted on by industry.³⁰⁵ [

] ³⁰⁶

204. Given that the e-mail was not a directive, did not result in a policy change, and was not acted on, it is difficult to understand how it could possibly qualify as an improper government “action” under Article XVII.

ii. The United States Has Provided No Evidence that “Local Knowledge” Conferred Any Benefit on B.C. Lumber Producers

205. The United States has provided no evidence that the encouragement of the use of “local knowledge” resulted in any change, much less an increase of Grade 4 logs caused by misgrading that resulted in producers paying lower prices for logs than they otherwise would have. The inability of the U.S. to prove its case is illustrated by its reliance on the fact that the percentage of logs scaled as Grade 4 increased to establish that a

³⁰⁴ Stmt. of Case ¶ 103.

³⁰⁵ Crover Stmt. ¶ 83 (Ex. R-3).

³⁰⁶ [] CAN-011810-17 at CAN-011810 (Ex. R-129).

circumvention of the Agreement has occurred.³⁰⁷ Measures can be found to circumvent the SLA only if they constitute “{g}rants or other benefits.”³⁰⁸ The United States is unable to put forward any evidence that the encouragement of local knowledge caused misgrading or provided any “benefit” to softwood lumber producers.

iii. If “Local Knowledge” Is an Action, It Is Grandfathered Under B.C.’s Scaling Regime

206. Since the Statement of Case has not made a sufficient allegation that any benefit was provided through the encouragement of local knowledge, no analysis of the grandfathering provision available under Article XVII(2) is necessary. However, in the unlikely event the Tribunal should find that the “local knowledge” e-mail was a government action that provided a benefit to softwood lumber producers, the encouragement of the use of local knowledge is grandfathered under Article XVII(2)(a).

207. Article XVII(2)(a) grandfathers all forest management and timber pricing systems as they existed on July 1, 2006. The ability to use local knowledge, which is a practice incorporated and approved in the Scaling Manual, was a part of B.C.’s timber

³⁰⁷ Stmt. of Case ¶ 103.

³⁰⁸ SLA 2006 Art. XVII(2)(Ex. R-1).

pricing and forest management systems that existed in B.C. on and long before July 1, 2006 and is therefore grandfathered.³⁰⁹

208. Indeed, the United States acknowledges not only that the use of local knowledge is grandfathered,³¹⁰ but also that “BC’s promotion of the use of ‘local knowledge’ is not itself a breach of the SLA.”³¹¹ The United States nevertheless goes on to argue that, “because the resultant grading practices increased the share of Grade 4 timber, BC is in breach unless Canada can show that the grading practices derived from ‘local knowledge’ resulted in stumpage fees *that maintain or improve the extent to which stumpage prices reflect market conditions.*”³¹²

209. In making this argument, the United States has confused the criteria for an action to be grandfathered because it existed on July 1, 2006, and the criteria for a new action that is safe harboured under Article XVII(2)(a). Article XVII (2)(a) provides protection for: (1) provincial timber pricing or forest management systems as they existed on July 1, 2006 *and* (2) modifications or updates that maintain or improve the extent to

³⁰⁹ See Scaling Manual (June 30, 2006) § 5.1.4 at 5-3 and § 6.6.2.1 at 6-103 (“Scalers use various accepted indicators at the local forest service level (local knowledge) to accurately estimate the length of defects.”) (Ex. R-19); *see also* Crover Stmt. ¶ 80 (Ex. R-3).

³¹⁰ Stmt. of Case ¶ 99 (stating that “{t}o be sure, the grandfathered system incorporated ‘local knowledge’”); *Id.* ¶ 100 (noting that “applying ‘local knowledge’ was already permitted”).

³¹¹ Stmt. of Case ¶ 103.

³¹² *Id.* (emphasis added).

which stumpage charges reflect market conditions, including prices and costs.³¹³ The requirement that the action maintain or improve the extent to which stumpage charges reflect market conditions, including prices and costs, applies only to the safe harbour for modifications or updates. It does not apply to the grandfathering prong of Article XVII(2)(a). Consequently, it is not necessary to show that local knowledge, which is conceded to be grandfathered, satisfies the safe harbour criteria in order for local knowledge to be protected under Article XVII(2)(a).

b. The Practice of Bucking

210. The United States seizes on another administrative communication suggesting the potential development and application of a grandfathered scaling practice to allege that “{i}n 2008, the Ministry began to actively encourage bucking at scale sites.”³¹⁴ “Bucking” is an industry term for cutting the end off of a log or cutting a log into segments. According to the United States, B.C. encouraged bucking of logs to lengths below 5 metres, which the United States alleges makes it more likely that the logs will be classified as Grade 4.³¹⁵ But the United States has not identified any change in policy or any change in practice associated with bucking, much less any change that could have resulted in higher grade logs being graded Grade 4. “Bucking” at scale sites subject to Ministry approval is a grandfathered part

³¹³ SLA 2006 Art. XVII(2)(a) (Ex. R-1).

³¹⁴ Stmt. of Case ¶ 135 (citing C-83 (Letter from Ministry to ISAC (Nov. 13, 2008))).

³¹⁵ Stmt. of Case ¶ 136.

of B.C.'s timber pricing system. No plausible reading of the SLA supports the theory that encouraging private industry to operate pursuant to existing practices and standards constitutes circumvention. Even if such encouragement could constitute circumvention, the communication by which the United States alleges B.C. "actively encourage{d} bucking at scale sites"³¹⁶ was, in fact, a request to develop a policy proposal. No such policy was developed or implemented.³¹⁷ Moreover, the data reflecting what actually happened at scale sites contradicts the U.S. assumption that bucking practice changed and caused misgrading.

i. Bucking at Scale Sites Has Been Permitted Since Before the SLA, and is thus Grandfathered

211. The practice of bucking is not the change to the grandfathered grading and scaling system that the United States claims it is. In fact, bucking existed prior to and at the time of the SLA. The United States correctly observes that "bucking at the scale site prior to scaling requires Ministry approval."³¹⁸ The Scaling Regulation has permitted bucking at the scale site with Ministry approval since at least 1995.³¹⁹ As James Crover explains in his

³¹⁶ Stmt. of Case ¶ 135.

³¹⁷ Crover Stmt. ¶ 106 (Ex. R-3).

³¹⁸ Stmt. of Case ¶ 135 (citing C-19 [] at CAN-007446-47 and C-85 (Ministry of Forests Memorandum (Aug. 8, 2007)) at CAN-010535).

³¹⁹ Scaling Regulation, B.C. Reg. 563/78, § 4 (Ex. R-145). In December 1994 the 1979 Scaling Regulation was replaced. The new Scaling Regulation also permitted bucking at the scale site with Ministry approval; *see* Scaling Regulation, B.C. Reg. 446/94, § 4 (Ex. R-22); *see also* Scaling Manual (June 1, 1995), § 1A.2.7.3, at 1A-8 ("Section 4 of the *Scaling Regulation* provides the necessary authority to control the bucking of logs prior to scaling.") (Ex. R-21).

witness statement, the standard for authorizing bucking at scale sites has been consistently applied since long before the SLA came into force.³²⁰

ii. The United States Has Not Identified Any “Action” or Change to the Practice of Bucking

212. The only evidence that the United States identifies for the proposition that “{i}n 2008, the Ministry began to actively encourage bucking at scale sites”³²¹ is a November 2008 memorandum from a Ministry official to the co-chairs of the Interior Scaling Advisory Committee (“ISAC”) requesting that ISAC develop “enhanced scaling practices.”³²² As part of that effort, the official requests that ISAC develop and recommend “criteria and {an} implementation plan for the bucking of MPB killed timber” for consideration by the Interior MPS committee.³²³

213. The request that ISAC develop enhanced scaling practices was part of an effort to develop ways for scale site operators unable to kiln re-dry MPB-killed logs to better identify checks.³²⁴ Bucking logs at the scale site removes a rough end of the log, exposing the Interior of the log where checks are more visible. Regardless of the merits of the proposal to further develop a policy regarding bucking, James Crover, the senior Ministry

³²⁰ Crover Stmt. ¶ 103 (Ex. R-3).

³²¹ Stmt. of Case ¶ 135.

³²² C-83 (Letter from Ministry to ISAC (Nov. 13, 2008) at CAN-011867).

³²³ *Id.* at CAN-001867.

³²⁴ Crover Stmt. ¶ 106 (Ex. R-3); *see also* C-83 (Letter from Ministry to ISAC (Nov. 13, 2008) at CAN-011867).

official with responsibility for scaling policy at the time, explains that no policy was in fact developed and no change was made.³²⁵

214. In fact, Mr. Crover has reviewed data concerning the average lengths of logs scaled in the B.C. Interior since 2006. As explained in Mr. Crover's witness statement, the percentage of logs under 5 metres at the time of scaling was generally stable during the relevant time period and actually declined slightly subsequent to the November 2008 communication that the United States has characterized as an "action."³²⁶ This is precisely the opposite of what one would expect if the United States were correct that "B.C. provided a benefit to lumber producers by promoting the widespread use of bucking."³²⁷ Similarly, Mr. Crover found that the percentage of logs classified as Grade 4 that were under 5 metres long did not increase after 2006.³²⁸ The U.S. allegations regarding bucking are therefore without merit.

215. The United States attempts to cobble together an argument that Interior scalers have diverted timber into Grade 4 by combining the grandfathered practice of bucking with a new formula for sweep.³²⁹ The U.S. argument misses the mark. First, as its

³²⁵ Crover Stmt. ¶ 106 (Ex. R-3).

³²⁶ See Crover Stmt. ¶ 107 (Ex. R-3).

³²⁷ Stmt. of Case ¶ 137; See Crover Stmt. ¶ 107 (Ex. R-3).

³²⁸ Crover Stmt. ¶ 107 (Ex. R-3).

³²⁹ Stmt. of Case ¶ 138.

name suggests, lodgepole pine is a very straight species of tree that is not prone to sweep, which is curvature along the length of the log.³³⁰ Thus, sweep, which is predominantly an issue with other species, has very little effect on the grading of lodgepole pine.³³¹ Second, and contrary to the U.S. assertion, the scaling rules regarding the assessment of sweep in logs of different lengths did not change. Scalers have always been required to assess logs in 2.5 metre segments. Specifically, with regard to sweep, scalers must determine whether a straight line of at least 2.5 metres exists.³³² As explained by Mr. Crover, the effect of sweep is less significant when applied over two 2.5 metre segments than it is when applied over a single 4.9 metre length. This fact has not changed since April 2006.³³³

2. The Scaling Requirements for Checked Logs

216. The third “change” by British Columbia that the United States claims to have circumvented the Agreement is the December 2007 adoption of the Scaling Requirements for Checked Logs, which the United States refers to as “the New Checks Conventions.”³³⁴ The United States alleges that the Scaling Requirements, which provided specific procedures for grading checked logs, “divert more MPB timber into Grade 4, resulting in timber that is

³³⁰ Lewis Stmt. at ¶ 79 (Ex. R-10); Crover Stmt. ¶ 108 (Ex. R-3).

³³¹ *Id.*

³³² Scaling Manual (June 30, 2006) § 6.4.2.7 at 6-49 (Ex. R-19).

³³³ Crover Stmt. ¶ 109 (Ex. R-3).

³³⁴ Stmt. of Case at 53.

not priced in accordance with the pricing system grandfathered by the SLA.”³³⁵ Specifically, the United States alleges that, by allowing scalers to determine log grade by measuring and counting checks³³⁶ and by deducting checked “collars” from the volume available to produce fracture-free lumber,³³⁷ the Scaling Requirements departed from the 50/50 rule and that this resulted in Grade 2 logs being classified as Grade 4.³³⁸ These allegations reflect a fundamental misunderstanding of the grandfathered log grading regime, of the 50/50 test, and of what constitutes circumvention under the SLA.

a. Background on the Scaling Requirements

217. The United States repeatedly insists that the April 2006 log grades were adopted only after B.C. had “extensively researched the effects of checks on lumber recovery”³³⁹ and that the April 2006 log grades were designed and tested to operate smoothly as the MPB outbreak progressed.³⁴⁰ The United States credits B.C. with too much prescience. When B.C. developed the April 2006 log grades, it was widely expected that the MPB’s spread would result in the harvest of more logs like the ones being harvested in 2005,

³³⁵ *Id.* ¶ 108.

³³⁶ *Id.* ¶¶ 112-113.

³³⁷ *Id.* ¶ 114.

³³⁸ *Id.* ¶¶ 112, 117.

³³⁹ *Id.* ¶ 109.

³⁴⁰ *Id.* ¶ 50 (“The April 2006 reforms were specifically designed to anticipate and accommodate the effects of the mountain pine beetle in the BC Interior both as those effects were experienced in 2006 and as they would be for the next decade.”).

i.e., recently killed pine.³⁴¹ [

] ³⁴² The Ministry did, however, anticipate that application of the April log grades, as with any new system, could encounter some difficulties. [

] ³⁴³

218. These monitoring efforts revealed that [

] ³⁴⁴ [

] ³⁴⁵ MPB-killed trees are

³⁴¹ See e.g. Snetsinger Stmt. ¶ 34 (Ex. R-7)(noting that predictions of the “shelf life” of MPB-killed pine varied widely when he became Chief Forester in late 2004); Lewis et al., *Wood decay and degradation in standing lodgepole pine killed by the mountain pine beetle*, Mountain Pine Beetle Initiative: Working Paper 2006-11, at ii (“[d]espite the number of past outbreaks...little is known about the rate of change in stand structure, and the rate of deterioration of wood properties with time since death”) (Ex. R-73).

³⁴² Crover Stmt. ¶¶ 72-75 (Ex. R-3); [] (Ex. R-2).

³⁴³ Crover Stmt. ¶ 70 (Ex. R-3); See also [] CAN-020942-44 (Ex. R-130).

³⁴⁴ Crover Stmt. ¶ 74 (Ex. R-3); [] at CAN-049058 [

](Ex. R-131); [] at CAN-049059-60 [

assessed in many cases.”] (Ex. R-132).

³⁴⁵ [] at CAN-010606-09

(Footnote continued on next page)

subject to more rapid moisture absorption than healthy trees.³⁴⁶ When a log absorbs moisture, it swells and checks can appear to close.³⁴⁷ Although a check may disappear when exposed to moisture, the check is still present in the log and must be accounted for to determine the log grade accurately.³⁴⁸ That there was a consistency problem is apparent from the seasonal variations in the percentage of Grade 4. During the cold, wet periods, when the majority of the pine harvest occurs, the percentage of Grade 4 declined substantially compared to the percentage of Grade 4 during warm, dry periods.³⁴⁹ The dynamic nature of checks also made it difficult for a Ministry check scaler to assess the accuracy of the original scaler unless the check scale was conducted under the same weather conditions as the original scale. The mere passage of several hours could easily change the extent to which checks are visible, creating a new challenge for check scalers.³⁵⁰

219. At the same time, the Ministry became aware that scalers in different districts and regions were attempting to deal with the unanticipated difficulties by developing their own variations on the application of the scaling rules. A number of “local practices” or

(Footnote continued from prior page)

] (Ex. R-133); *See also* CAN-049058 (Ex. R-131).

³⁴⁶ Oliveira Report ¶ 61 (Ex. R-11); Crover Stmt. ¶ 72 (Ex. R-3).

³⁴⁷ Lewis Report ¶ 56 (Ex. R-10).

³⁴⁸ Crover Stmt. ¶¶ 43-44, 72 (Ex. R-3).

³⁴⁹ *Id.* ¶ 85; [

] CAN-011809-20 (Ex. R-30).

³⁵⁰ *Id.* ¶ 72.

interpretations of scaling rules developed in different districts, which were inconsistent with one another and, more problematically, potentially inconsistent with the 50/50 test.³⁵¹

220. In responding to these challenges, the Ministry issued the Scaling Requirements, which combined geometric calculations for implementing the 50/50 rule under the Scaling Manual with research-driven knowledge about the physical attributes of MPB-killed lodgepole pine. The Scaling Requirements were thus intended to increase the efficiency, accuracy, and consistency of scalers' application of the grandfathered Scaling Regime.³⁵²

b. The Scaling Requirements Implement the 50/50 Rule Consistent with the Grandfathered Scaling Regime

221. The United States characterizes two elements of the Scaling Requirements as untested departures from the 50/50 rule: (1) allowing scalers to assess grade in MPB-killed logs based on the number of checks,³⁵³ and (2) subtracting as unavailable – to manufacture fracture-free lumber – a 2 cm collar around the perimeter of MPB-killed logs larger than 10 cm in radius from the volume available to make lumber when such logs are missing more

³⁵¹ *Id.* ¶ 81; *See also* C-82 (Memorandum from Bill Howard (Nov. 28, 2007) at CAN-011400) (noting that “difficulties in seeing checks have resulted in a number of local practices being adopted, which are contrary to Ministry scaling policies (i.e. use of the 10 cm circle)”).

³⁵² Crover Stmt. ¶¶ 92-94 (Ex. R-3).

³⁵³ Stmt. of Case ¶¶ 111-112.

than 50 percent of their bark.³⁵⁴ These two elements, however, were developed specifically to maintain adherence to the 50/50 rule. The United States’ allegations that these elements of the Scaling Requirements depart from the 50/50 rule reflect fundamental misconceptions about what that rule means and how the grandfathered log grading system operates.

222. The relevant portions of the Scaling Requirements which the United States takes issue are reproduced in the figure below:

Garde code 2 requirements

Check logs with <50% of the bark on the log (visual estimate +/- 10%) with either blue stain or beetle galleries.

rads	5-7	8	9	10+
# checks on log ends	1(4cm)	2(4cm);or 1 spiral (4 cm) affecting more than 1 quadrant	3(4cm);or 1 spiral (4 cm) affecting more than 1 quadrant	These logs cannot be downgraded for surface checks alone. They must have a different defect such as rot or heart check. Refer to the grading Chapter.
% of grade reduction	100	100	100	Logs (greater than equal) 10 rads within this table subtract 2 rads from the diameter for grade reduction.

The assumption is built into the table above that shallow surface checks occur where there is no bark.

Check logs with >50% of the bark on the log (visual estimate +/- 10%) with either blue stain or beetle galleries.

³⁵⁴ Stmt. of Case ¶ 115.

rads	5-7	8	9	10+
# checks on log ends	1(4cm)	3 straight (4 cm) or 2 spiral (4cm) affecting more than 2 quadrants	4 straight (4 cm) or 2 spiral (4cm) affecting more than 2 quadrants	These logs cannot be downgraded for surface checks alone. They must have a different defect such as rot or heart check. Refer to the grading Chapter.
% of grade reduction	100	100	100	

Figure 32: Excerpt from C-82: Scaling Requirements for Checked Logs (CAN-011402)

223. First, the United States asserts that “{u}nder the new conventions that apply only to MPB timber, the scaler counts the number of checks present within a 2.5 meter section of a log, determines whether the log is at least 50 percent covered by bark, and then applies a formula to assign a grade. At no point does the scaler calculate, or attempt to calculate, whether the log actually meets the 50/50 rule.”³⁵⁵ Identifying the number (and depth) of checks within a 2.5 metre section of log is not, however, a departure from the grandfathered grading system of the 50/50 rule. To the contrary, identifying and measuring checks is critical to determining the volume of a log that is available to manufacture fracture-free lumber. This is explicit in the section of the Scaling Manual entitled, “Log

³⁵⁵ Stmt. of Case ¶ 112.

Characteristics Which Reduce Product Recovery (Quantity): Fractures and Fibre Separation,” as well as in numerous other portions of the Scaling Manual.³⁵⁶ If a check appears in a 2.5 metre segment of a log, the volume occupied by that check (plus trim allowance) is not available to manufacture lumber under the 50/50 test and the Scaling Manual’s definition of “lumber,” and is thus relevant and essential to the assignment of grade.³⁵⁷

224. To the extent the U.S. complaint is about the fact that a scaler applying the Scaling Requirements does not “calculate, or attempt to calculate, whether the log actually meets the 50/50 rule,” that complaint is misplaced.³⁵⁸ The fact that the Scaling Requirements reflect geometric calculations renders hollow the U.S. criticism of the Scaling Requirements as “untested.” For example, the proposition that the area of a circle equals π times radius squared is not one that should require scientific testing. There is nothing about the grandfathered regime that requires a scaler to manually perform every calculation.

225. Second, the United States also challenges the so-called “two-centimeter rule,” which it characterizes as providing that, “for logs with a radius equal to or greater than 10 centimeters, scalers ‘subtract 2 cm of radius from the diameter as a grade reduction.’”³⁵⁹ In

³⁵⁶ Scaling Manual (June 30, 2006), § 6.3.1.1, at 6-7, Figure 6.9 at 6-39 (Ex. R-19).

³⁵⁷ Crover Stmt. ¶¶ 43-44 (Ex. R-3);

³⁵⁸ Stmt. of Case ¶ 112.

³⁵⁹ Stmt. of Case ¶ 115.

other words, the United States takes issue with the cells in the upper-right hand corner of the Scaling Requirements chart, which instruct scalers to deduct 2 cm from a log 10 cm in radius (20 cm in diameter) when calculating the volume available to manufacture lumber, *if* that log is missing more than half of its bark.

226. Industry and Ministry scalers, as well as mill operators, consistently observed that Grey Stage logs develop shallow checking around the perimeter; a reliable indicator that a tree has been dead for a long period.³⁶⁰ Shallow perimeter checks were difficult to see under normal scaling conditions, when MPB-killed logs may have swollen to obscure even deep checks. The Ministry chose to use missing – rather than just loose – bark as a conservative indicator that a log had been long dead and was likely to have extensive checking around its perimeter.³⁶¹

227. Deducting the volume lost to shallow surface checking around the perimeter of a long-dead log is entirely consistent with the 50/50 rule as implemented by the Scaling Manual, as such volume is not available to manufacture fracture-free lumber. The Ministry knew that such checking would likely be present, but difficult to see, in long-dead MPB-killed logs missing most of their bark. Both Professor Lewis and Dr. Oliveira confirm that

³⁶⁰ Crover Stmt. ¶ 97 (Ex. R-3); *see also* Lewis Report ¶ 82 (Ex. R-10).

³⁶¹ Dr. Lewis confirms that missing bark is an indicator that a tree has been dead for some time. Lewis Report ¶¶ 58-59, 82 (Ex. R-10).

such checks are consistent with their understandings of how trees dry.³⁶² The United States has presented no evidence to the contrary.

c. Measures that Increase the Accuracy With Which Scalers Can Identify the Physical Characteristics of Logs Cannot Constitute the Provision of Benefits to Producers or Exporters of Softwood Lumber

228. The Scaling Requirements facilitate the accurate and efficient identification of log grades,³⁶³ and thereby enable assessment of the correct stumpage. Facilitating accuracy and consistency of scaling and grading does not constitute a benefit.

229. The Scaling Requirements do not represent the implementation of untested practices, but instead were developed in response to observed field issues, were consistent with sound science, and involved the application of the same mathematical formulae used in the April 2006 Scaling Manual, formulae the United States acknowledges were well tested.³⁶⁴

230. Most significantly, the United States presents no empirical evidence whatsoever to even suggest that the Scaling Requirements, which were introduced some eight months after the volume of Grade 4 began to increase, resulted in a single instance of

³⁶² Lewis Report ¶ 82 (Ex. R-10); *see generally* Oliveira Report (Ex. R-11).

³⁶³ Crover Stmt. ¶ 78, n.58 (Ex. R-3).

³⁶⁴ *See* Stmt. of Case ¶ 45 (acknowledging that ISAC “had conducted comprehensive tests of the draft grading rules on actual logs and compared the results to results obtained by grading under the existing rules.”).

inaccurate application of the 50/50 rule, much less the inappropriate diversion of MPB-killed timber into Grade 4.

d. Even if Benefits Were Provided to Softwood Lumber Producers, the Scaling Requirements Are Safeharboured Under Article XVII(2)

231. Article XVII(2)(a) permits the continuation of timber pricing and forest management systems as they existed on July 1, 2006, and modifications or updates to those programs provided they “maintain or improve the extent to which stumpage charges reflect market conditions, including prices and costs.”³⁶⁵

232. The Scaling Requirements fall within the (2)(a) safe harbour by being grandfathered, or if not grandfathered, safe harboured. The Forest Act, the Scaling Regulation and Scaling Manual, as well as the MPS, are part of the forest management and timber pricing systems that existed in B.C. as of July 1, 2006. These systems include the stipulation that Grade 4 logs are charged a stumpage rate of C \$0.25 per cubic metre. As discussed in more detail above,³⁶⁶ the calculations used in the Scaling Requirements are consistent with the requirements of the Scaling Regulation as implemented by the June 30, 2006 Scaling Manual.³⁶⁷

³⁶⁵ SLA 2006 Art. XVII(2)(a) (Ex. R-1).

³⁶⁶ See *supra* Part II.B.1.

³⁶⁷ Crover Stmt. ¶ 93 (Ex. R-3).

233. Even if the Scaling Requirements are not grandfathered, they are safe harboured under Article XVII(2)(a). These Scaling Requirements were part of the attempt to deal with the rapidly declining timber quality in B.C. due to the MPB epidemic. They allow scalers to more accurately and efficiently assess the quality of timber killed by the MPB,³⁶⁸ thereby improving the extent to which stumpage reflect market conditions. As Professor Kalt explains, BC [

]...These and related adaptations to the MPB epidemic are consonant in direction and character with the market conditions that have developed over time in the B.C. lumber industry.”³⁶⁹

234. Further, as noted in the SLA, “other factors affecting the value of the province’s timber, such as transportation costs, exchange rates, and *timber quality* and natural harvesting conditions, do not constitute circumvention.”³⁷⁰ This language reflects the Parties’ understanding that timber quality is an important element of forest management, which may fluctuate without constituting a circumvention of the SLA. That the volume of Grade 4 timber increased due to the worsening quality of these MPB-killed logs does not itself constitute a breach. Accordingly, the adoption of methods that more accurately assess the quality and volume of timber, and therefore maintain or improve the extent to which

³⁶⁸ Crover Stmt. ¶¶ 92-100 (Ex. R-3).

³⁶⁹ Kalt Report [] (Ex. R-9).

³⁷⁰ SLA 2006 Art. XVII(2)(a) (Ex. R-1) (emphasis added).

stumpage charges reflect market conditions, are protected by Article XVII(2)(a)'s safe harbour and are not a circumvention.

3. Kiln Re-drying

a. Kiln Re-drying was Introduced to Facilitate the More Accurate and Efficient Detection of Checks

235. The United States describes kiln re-drying as “yet another example of how BC modified the Interior grading and pricing system to allow producers to derive a benefit on a *de jure* basis.”³⁷¹ Kiln re-drying was a process that was developed and supported by sound science to allow scalers to more accurately detect checks that render segments of logs unavailable to manufacture fracture-free lumber but that were rendered temporarily undetectable due to weather conditions. The United States points to no science or evidence to the contrary.

236. [

.]³⁷² Scrutiny of the seasonal variations

suggested that these swings were attributable to scalers' inability to fully assess checking during wet or moist conditions. Checks that are visible on a warm summer day can swell

³⁷¹ Stmt. of Case ¶ 118.

³⁷² Crover Stmt. [] (Ex. R-3).

and close due to rain or snowfall or mud, rendering the checks invisible. Changes to the visibility of checks can occur in just hours. This is validated by research which shows that MPB-killed wood has a higher permeability than green wood, and therefore absorbs and loses moisture very quickly.³⁷³

237. The severe variance in the visibility of checks depending on atmospheric conditions, and the difficulties it imposed on the accurate and efficient identification of Grade 4 logs, dominated grading-related discussions within the Ministry, industry, and ISAC in 2007.³⁷⁴ Kiln re-drying was authorized to ensure that a log's grade reflected the objective physical characteristics of the log, rather than the season or the weather on the day it was scaled.

238. Industry began in 2007 to experiment with the use of lumber kilns to re-dry logs to make checks visible. [

] ³⁷⁵ One of [

³⁷³ Lewis Stmt. ¶ 49 (Ex. R-10); Crover Stmt. ¶ 72 (Ex. R-3).

³⁷⁴ See, e.g. C-79 (ISAC Grading Sub-committee Meeting Minutes (Jan. 31, 2007) at CAN-007180) (noting that the issue of "Measurement of checks in the winter" is "of great concern to industry"); ISAC Meeting Minutes (Mar. 6, 2007) at CAN-07189 (noting in context of discussion of checks that the "primary concern was winter condition.") (Ex. R-146); Crover Stmt. ¶¶ 84-91 (Ex. R-3).

³⁷⁵ See, e.g. C-52 [] at CAN-010640-41 []; See also C-29 [].

] recommendations was that lumber kilns could be used to mimic a warm summer day, thereby correcting some of the distortions in grading accuracy caused by seasonal variations. [

] ³⁷⁶

239. In late October 2007, the Ministry carried out its [

] ³⁷⁷

240. In early November of 2007, two Interior Forest Districts – Quesnel and Central Cariboo – authorized five scale sites to adopt kiln re-drying procedures on a limited trial basis, and subject to strict Ministry supervision. West Fraser operated four of the scale sites, and Canfor operated the fifth. [

] ³⁷⁸

241. On January 3, 2008, the Ministry retained Dr. Luiz Oliveira, a leading specialist in wood drying, to develop guidelines for industry use of lumber kilns to re-dry checked logs

³⁷⁶ [] (Ex. R-2).

³⁷⁷ See e.g. [], CAN-028337-41 (Ex. R-31).

³⁷⁸ [] at CAN-028734-35 (Ex. R-32); [] at CAN-028214-16 (Ex. R-134); [] at CAN-028217-19 (Ex. R-134).

prior to scaling. Specifically, the Ministry requested that Dr. Oliveira develop a protocol based on scientific principles for re-drying MPB-killed logs that: (a) would not cause the development of new checks; (b) would not increase the dimensions, in terms of width or depth, of existing checks; and (c) would improve scalers' abilities to correctly and consistently assess log grade.³⁷⁹

242. Dr. Oliveira developed a set of conservative guidelines to achieve those objectives by relying on the same well-established scientific principles he had used in the design of drying schedules for lumber products over more than thirty years. That is, Dr. Oliveira accounted for the initial moisture content of MPB-killed logs (low), the atmospheric conditions present in scaling yards depending on the season and time of day (varied, but often higher than that of MPB-killed logs), the natural exchange of moisture between logs and the atmosphere until an equilibrium is reached (a function of permeability), and the effect of moisture on dry wood (swelling). He then calculated the appropriate conditions (temperature, relative humidity, and air velocity) to enable visual identification of existing checks.³⁸⁰

243. The guidelines that Dr. Oliveira developed and the Ministry adopted required that kilns used to re-dry logs not exceed the atmospheric conditions of a warm summer's

³⁷⁹ Oliveira Report ¶ 14 (Ex. R-11); *see also* Crover Stmt. ¶¶ 84-91 (Ex. R-3).

³⁸⁰ Oliveira Report ¶ 25 (Ex. R-11).

day.³⁸¹ Kiln re-drying pursuant to the guidelines is a gentle process. The allowable temperature range for kiln re-drying is 7°C to 32°C (45-90°F). Contrary to what the United States would like the Tribunal to believe, logs are not cooked; they are gently warmed to bring moisture content back to levels at which the logs' physical characteristics are visible.³⁸²

244. Dr. Oliveira also advised the Ministry on the technical aspects of a compliance and enforcement regime that mills implementing his guidelines would be required to follow.³⁸³ This included the requirement that kiln operators record the conditions under which they re-dried logs in kilns on “charge reports” that were provided to Ministry.³⁸⁴

245. []³⁸⁵

To facilitate understanding and proper use of the guidelines, the Ministry asked Dr. Oliveira to conduct seminars at three of the largest and most representative regional offices of the Ministry: Kamloops, Williams Lake, and Prince George. [

³⁸¹ Oliveira Report ¶¶ 28, 34 (Ex. R-11); [], CAN-011423-37 [] (Ex. R-34).

³⁸² Oliveira Report ¶ 27 and App. IV – Guidelines for Heating up MPB Logs in Conventional Lumber Drying Kilns) (Ex. R-11).

³⁸³ Oliveira Report ¶¶ 36-37 (Ex. R-11).

³⁸⁴ Oliveira Report, App. 5, Kiln Charge Report (Ex. R-11).

³⁸⁵ [], CAN-019720 (Ex. R-135).

] ³⁸⁶

b. The Proper Use of Kilns Does Not Create Defects that Would Lead to a Downgrade of a Grade 2 Log to a Grade 4 Log

246. At the same time that it adopted and distributed the guidelines, the Ministry requested that Dr. Oliveira evaluate industry adherence to the guidelines. In his March 2008 report resulting from that investigation, Dr. Oliveira confirmed that the guidelines, in practice, were conservative, that mills were operating within the guidelines and that the re-drying process did not create a significant number of new checks or exacerbate existing checks.³⁸⁷ Dr. Oliveira did observe several instances in which small new checks developed or existing checks grew after kiln re-drying, but, in each case, the change was minor, and Ministry scalers assisting in the research confirmed that log grade did not change as a result. The Ministry also routinely checked that the guidelines were in fact being followed.³⁸⁸

247. Since that time, Dr. Oliveira has conducted further research into the effects of re-drying MPB-killed logs pursuant to the guidelines. Re-drying according to the guidelines

³⁸⁶ [] at CAN-011406 (Ex. R-136).

³⁸⁷ Dr. Luiz Oliveira & Alan Kostiuk, Report: Follow-up on the Implementation of the ‘Guidelines for Heating up MPB Logs in Conventional Lumber Dry Kilns’ (FPIInnovations, Mar 2008) Oliveira Report, App. VI (Ex. R-11).

³⁸⁸ Crover Stmt. ¶ 90 (Ex. R-3).

is an effective technique to improve the visibility of existing checks and thereby, to improve the accuracy and consistency of grading MPB-killed logs.³⁸⁹

248. As described by Mr. Crover in his Witness Statement, the Ministry also implemented a rigorous compliance and enforcement regime to ensure strict adherence by mills to the guidelines. For one, the Ministry subjected sample log loads subject to re-drying to more frequent check-scaling. [

] ³⁹⁰ The Ministry rejected *any* sample loads for which the Log Kiln Charge Reports showed *any* deviation from the guidelines.

c. Measures that Increase the Accuracy With Which Scalers Can Identify the Physical Characteristics of Logs Cannot Constitute the Provision of Benefits to Canadian Softwood Lumber Producers

249. The United States argues that whether kiln warming makes checks more visible “is beside the point” because kiln warming “has never been tested for its accuracy in applying the 50/50 rule.”³⁹¹ This argument again reveals the fundamental mischaracterization of the Scaling Regime that lies at the heart of the U.S. claims. Put

³⁸⁹ As set forth in Dr. Oliveira’s report, the research confirms that re-drying MPB-killed logs in accordance with the guidelines exposes existing checks, but does not materially create or expand checks. Oliveira Report ¶ 74 (Ex. R-11).

³⁹⁰ Crover Stmt. ¶¶ []-91 (Ex. R-3).

³⁹¹ Stmt. of Case ¶ 120.

simply, the Scaling Manual requires scalers to identify checks to implement the 50/50 rule. Identifying and measuring checks was essential to the application of the 50/50 rule as set forth in the April 2006 revisions to the Scaling Manual, and has remained essential ever since. Dr. Oliveira's Expert Report is incontrovertible evidence that kiln re-drying makes checks more visible, enhancing a scaler's ability to accurately grade checked logs.

250. When checks are visible, logs are graded accurately. When checks are invisible due to atmospheric conditions in the scaling yard, logs that should be Grade 4 are inaccurately graded as Grade 2.³⁹² Kiln re-drying simply eliminates a meteorological variable in the identification of log characteristics so that scalers can apply the 50/50 test as implemented by the Scaling Manual.

251. Any improvements to the accuracy of identifying Grade 4 logs, such as re-drying, operate only to ensure adherence to the bargain struck in the SLA, which grandfathered C \$0.25 stumpage for logs meeting the definition of Grade 4. Such improvements are incapable of constituting a benefit under Article XVII(2).

³⁹² See [] (Ex. R-2); *see also* Oliveira Report ¶¶ 11-12 (Ex. R-11).

d. Even if Benefits Were Provided to Softwood Lumber Producers, Kiln Re-drying Is Grandfathered or Alternatively Safe Harboured Under Article XVII(2)(a)

252. The grandfathered Scaling Regime requires that scalers identify and account for checks in logs.³⁹³ Neither the Regulation nor the Scaling Manual, however, specifies any particular method for identifying checks.³⁹⁴ Under the grandfathered system, scalers are free to use any technique for identifying existing checks and applying the rules and calculations of the Scaling Manual.³⁹⁵ Scalers have thus used scaling sticks, dyes, measuring tape, and other tools to identify and measure checks. If a scaler chose to use lasers, x-rays, or microscopes to identify and measure checks, that would be consistent with the grandfathered Scaling Regime as long as it was accurate. Kiln re-drying is simply a particularly effective tool that allows scalers to grade logs based on their actual physical characteristics, rather than superficial appearances that change with the weather. Kiln re-drying is thus permitted under the grandfathered Scaling Regime, and authorizing the practice cannot constitute circumvention.

253. Even if the Tribunal finds that kiln re-drying is not grandfathered, it would be safe harboured under Article XVII(2)(a) in that it would be a modification that maintains the

³⁹³ *Scaling Manual* (June 30, 2006), § 6.3.1.1 at 6-7 and Fig. 6.9 at 6-39 (Ex. R-19).

³⁹⁴ See *Scaling Regulation*, B.C. Reg. 446/94, § 6 – Scaling Procedures (requiring only the computation of volume and classification of grade but not requiring application of particular method) (Ex. R-22); *Scaling Manual* (June 30, 2006), § 6.3.1.1 at 6-7, § 6.4 at 6-14-16 (Ex. R-19).

³⁹⁵ Crover Stmt. ¶ 44 (Ex. R-3).

extent to which stumpage charges reflect market conditions, including changes in timber quality. As discussed above, the safe harbor in Article XVII(2) reflects the Parties' agreement that modifications to the timber pricing system may be necessary and appropriate to address fluctuations in timber quality, and that such modifications do not constitute circumvention. More accurate information about timber quality – in this case, through accurate identification of log characteristics that are supposed to be accounted for in assigning grades to logs – allows British Columbia's MPS to more accurately transmit market conditions into stumpage charges.³⁹⁶ Because kiln re-drying enhances the accuracy of log grades, its authorization by B.C. is safe harboured. As part of the July 2010 policy changes in which the most heavily damaged pine stands began to be sold on a "lump sum" basis (thereby eliminating the distinction between "sawlogs" and "low grade"), kiln re-drying was phased out and terminated altogether effective July 1, 2011.

4. B.C. Enforces Its Scaling Regime

254. Finally, the United States attempts to make the case that B.C. knowingly "fail{ed} to apply and enforce the Interior ... grading system," which "allowed increasing amounts of timber to be assigned to Grade 4 without regard to the timber's lumber-

³⁹⁶ Professor Kalt's observations about how a market responsive system will focus on accuracy apply equally to kiln re-drying. Kalt Report ¶ 62 (Ex. R-9).

suitability,”³⁹⁷ and that B.C. failed to respond to what it claims was clear “defiance” on the part of industry and a disregard “of Ministry staff and directives.”³⁹⁸ This argument, at best, accuses B.C. of tolerating rampant flouting of the scaling rules by lumber industry scalers. At worst, the United States charges the Government of British Columbia with participating in a deliberate and pervasive conspiracy to defraud the Province of its lawful stumpage revenue. The Tribunal should reject these reckless and unfounded accusations.

255. If the United States is suggesting that British Columbia failed to enforce its domestic legal requirements, the United States has not pursued that claim appropriately under Article XVII.³⁹⁹ That said, claims by the United States that scalers were not disciplined and that B.C. failed to enforce the Interior Grading System are contrary to the facts. As discussed below, the grading rules are backed by a robust and comprehensive compliance and enforcement regime, and the United States has failed to identify an instance in which B.C. failed to apply its rules or acquiesced to industry defiance of those rules.

a. British Columbia Has a Strong Compliance and Enforcement Regime

256. The B.C. Ministry’s Timber Pricing (“Pricing”) and Compliance & Enforcement (“C&E”) Branches maintain a robust Scaling Regime, governed by statute and

³⁹⁷ Stmt. of Case ¶ 144.

³⁹⁸ *Id.* ¶¶ 145-149.

³⁹⁹ Compare Article XVII(1) with Article XVII(3) (Ex. R-1).

regulation and implemented through the Scaling Manual. Part 6 of the B.C. Forest Act,⁴⁰⁰ requires that all timber harvested from Crown and private land must be scaled to determine its volume and quality (*i.e.*, grade) before it can be manufactured into products, sold, or transported to a place other than where it will be scaled. Part 6 of the Forest Act is implemented through the B.C. Scaling Regulation. An industry scaler must be licensed and obtain District authorization for each scale site at which he or she would like to scale.

257. B.C. scaling staff are Forest Officers under the Forest Act and have the authority to issue violation tickets within their Districts for scaling, recreation, timber marking and transportation violations. The violation tickets may be issued for any compliance issues noticed during check scales, scale-site inspections, and other visits to logging and scaling operations, such as the failure to leave the last load scaled on the ground for the check scaler.

258. The Ministry performs targeted, unannounced “check scales,” or remeasurements of loads scaled by industry scalers, to ensure that industry scalers operate in accordance with B.C. law.⁴⁰¹ Check scalers compare the original scale volumes and grades with their own in order to ensure industry scalers’ compliance with the applicable scale

⁴⁰⁰ Forest Act, R.S.B.C. 1996, C 157, Part 6 (Ex. R-20).

⁴⁰¹ Crover Stmt. ¶ 21 (Ex. R-3).

authorization.⁴⁰² Pursuant to the Forest Act and the B.C. Scaling Regulation, if the results of the original scale (volume and grade) differ by more than 3 percent from the check scale, it fails and the check scale replaces the original scale for the load.⁴⁰³ The Harvest Billing System (“HBS”) tracks check scale results and an industry scaler’s risk rating is impacted by failed check scales. As Mr. Crover explains in his witness statement, the Ministry performed 12,320 check scales between 2006 and 2010, 1,076 of which resulted in replacement scales.⁴⁰⁴ He further notes that during this timeframe, the annual percentage of scales replaced by check scales varied between 8.3 and 10.6 percent.⁴⁰⁵

259. Any misconduct, cheating or deliberate misgrading at the behest of employers, as the U.S. alleges was occurring between 2007 and 2010, results in the scaler losing his or her license and significant penalties.⁴⁰⁶ To suggest, as the United States does, that scalers were defiant in their disregard of the Scaling Regulations and that the Ministry deliberately ignored industry scalers who were misgrading is baseless.

⁴⁰² *Id.*

⁴⁰³ *Forest Act*, R.S.B.C. 1996 § 97(4) (Ex. R-20); Scaling Regulation, B.C. Reg. 446/94 at § 14 (Ex. R-22).

⁴⁰⁴ Crover Stmt. ¶ 23 (Ex. R-3).

⁴⁰⁵ *Id.*

⁴⁰⁶ Scaling Manual (June 30, 2006), § 11.5.6 at 11-35 (Suspensions and Cancellations)(stating that “where scalers fail to properly perform their duties” the Chief Forester may cancel a scaling license; and that failure to “perform in a capable and competent manner” could result in the suspension or cancellation of a scaler’s authorization or appointment) (Ex. R-19).

b. British Columbia Applied and Enforced its Scaling Rules

260. The United States’ allegations that British Columbia failed to enforce its scaling rules and tolerated defiance of those rules by industry scalers depend on out-of-context reports and remarks indicating that the Ministry knew that someone among the more than a thousand licensed industry scalers operating in B.C. may have violated the scaling rules. The United States then asserts with respect to each of the situations it identifies, that “no action appears to have been taken in response,”⁴⁰⁷ that “{n}othing indicates the Ministry disciplined or otherwise responded to the lumber producer’s refusal to adhere to the Ministry’s interpretation {of the rules},”⁴⁰⁸ or that “industry appeared to pay no price for its defiance.”⁴⁰⁹ A review of the facts behind the U.S. innuendos reveals just the opposite of what the United States claims. Far from identifying instances in which B.C. failed to enforce its scaling rules, the United States has highlighted B.C.’s pervasive culture of faithful compliance with, and diligent enforcement of, the grandfathered Scaling Regime.

261. First, the United States quotes the [

⁴⁰⁷ Stmt. of Case ¶ 147.

⁴⁰⁸ Stmt. of Case ¶ 148.

⁴⁰⁹ Stmt. of Case ¶ 149.

] ⁴¹⁰ As an initial matter, the grandfathered Scaling Regime permits up to 3 percent variance between a scale and a check scale.⁴¹¹ Even though the conduct being reported fell within the tolerances of the rules, the evidence reflects that Ministry took very seriously reports that scalers might be under pressure to deliberately skew results within those tolerances. The Ministry characterized this as compromising scaler integrity. The solution, which the United States insinuates was insufficient, [

] ⁴¹² Reminding scalers that pushing the limits of the rules is not acceptable reflects a reasonable response to these anecdotal reports, and nothing in the facts suggests that more extreme measures were warranted.

262. Similarly, the United States refers to [

] ⁴¹³ The minutes do not reflect reports that this type of manipulation was occurring. The discussion of a potential means of manipulating scaling results does not reflect acquiescence in such manipulation. To the contrary, it reflects the serious activities of engaged government officials. The U.S. assertion

⁴¹⁰ Stmt. of Case ¶ 145, n.238.

⁴¹¹ Forest Act, R.S.B.C. 1996 § 97(4) (Ex. R-20); Scaling Regulation, B.C. Reg. 446/94 at § 14 (Ex. R-22).

⁴¹² Stmt. of Case ¶ 145, n.239.

⁴¹³ Stmt. of Case ¶ 146, n.240 (citing C-71 [] at CAN-026468).

that []⁴¹⁴ bears no resemblance to the facts. First, the discussion of potential manipulation occurred during a conference call of Ministry scaling supervisors, not during a meeting of the Interior Scaling Advisory Committee (a joint Ministry/industry committee that provides advice to policy makers on matters related to scaling). Second, the minutes of the conference call do not indicate any relationship between the discussion of potential manipulation of scaling results and the discussion of administering the Scalers' Oath.

263. Second, the United States asserts that in August 2007 the Ministry [

] ⁴¹⁵ [

] ⁴¹⁶ [

⁴¹⁴ Stmt. of Case ¶ 146.

⁴¹⁵ Stmt. of Case ¶ 147.

⁴¹⁶ C-73 [

] at CAN-010542 [

].

] ⁴¹⁷ [

] ⁴¹⁸ The existence of a disagreement about the correct interpretation of a scaling rule followed by deliberation and clarification by supervisors reflects a functional regulatory regime, not government complacency or a system run amok.

264. Third, the United States asserts that the Ministry [

] ⁴¹⁹ This assertion, again, is counter to the facts and misreads the documents in question. In [

⁴¹⁷ *Id.* at CAN-010539.

⁴¹⁸ *Id.*

⁴¹⁹ Stmt. of Case ¶ 148.

⁴²⁰ C-74 [] at CAN-042439).

] ⁴²³ [

] ⁴²⁴ The United States fails to explain why it believes B.C. should have disciplined a lumber company for engaging its regulator in discussions about the proper interpretation of the applicable rules.

265. Finally, the United States also contends that the [

⁴²¹ *Id.* at CAN-042437-38.

⁴²² *Id.* at CAN-042437.

⁴²³ C-75 [] at CAN-042440).

⁴²⁴ [] at CAN-007147] (Ex. R-137); [] at CAN-010919 [

] (Ex. R-138); ISAC Meeting Minutes (Dec. 6, 2006) at CAN-007168 (noting that D. Hascarl had disagreed with the Ministry but that the Ministry “decided to keep 10 cm core / collar and 10 cm between defects (status quo).”) (Ex. R-139).

] ⁴²⁵ [

] ⁴²⁶ [

] ⁴²⁷ [

] ⁴²⁸ [

] ⁴²⁹

There is no evidence of any further incident involving a Ministry official being barred from a scale site.

266. The United States has failed to identify facts supporting the allegation that B.C. failed to enforce its scaling rules, much less that it deliberately colluded with industry to effect a *de facto* revocation of those rules.

⁴²⁵ Stmt. of Case ¶ 149, n.249.

⁴²⁶ See generally C-76 [] and C-78 []; C-77

⁴²⁷ C-77 [] at CAN-011250).

⁴²⁸ C-78 [] at CAN-007201).

⁴²⁹ *Id.*

C. BRITISH COLUMBIA'S AUCTION SYSTEM PRICES TIMBER AT MARKET VALUE

267. The economic premise underlying the U.S. claim that British Columbia provided benefits to B.C. lumber producers is that B.C. sold, for C \$0.25 per cubic metre, Grade 4 logs that were worth more than that price. That premise is flawed, and exhibits a fundamental misunderstanding about the operation of the Province's timber pricing system. Grade 4 is not intended to affect government stumpage revenues. Indeed, the MPS system was designed so that the average stumpage rate in the Interior Region and total stumpage revenue to the government would not be affected by the amount of low grade timber in the harvest.

268. The United States and Dr. Neuberger fail to take into account that B.C. stumpage rates reflect the market values of entire stands of timber. Grade 4 timber is not sold separately, as the U.S. argument presumes. Rather, in the BCTS timber auctions, the harvest rights to Grade 4 timber are bundled together with the harvest rights to Grade 1 and Grade 2 timber. This ensures that the winning bids capture the market value of the entire stand and that the stumpage rates established in the MPS system do likewise.⁴³⁰

269. In 2003, B.C. initiated planning for a system in which timber auctions could provide the basis for pricing the timber harvested under long-term tenures. To implement

⁴³⁰ Athey & Cramton Report ¶ 78 (Ex. R-8).

this market-based system, B.C. took back tenure rights from long-term tenure holders to expand auction sales to approximately 20 percent of the annual harvest; established BCTS as a unit within the Ministry with a mandate to administer a competitive auction program that could be used as a reference point for the stumpage system; and modified the previous auction program to ensure that sales were open to all bidders, and that bids were awarded strictly on the basis of the highest bid price.⁴³¹ In July 2006, the MPS was implemented in the B.C. Interior Region. MPS uses the BCTS auction prices to establish prices for the remaining 80 percent of the annual harvest by long-term tenure holders.⁴³² The MPS pricing system is specifically grandfathered in Section XVII(4) of the SLA.

270. Throughout these market-based reforms, British Columbia was advised by a team of leading economists with specialized expertise in auction design, Professors Athey and Cramton, to help design and implement the new auction-based pricing system. These auction experts were asked by Canada in this proceeding to provide a report to the Tribunal on whether the statutory price of C \$0.25/m³ for Grade 4 logs implies that Grade 4 timber in B.C. is “underpriced.” Professors Athey and Cramton conclude in their report that “the Market Pricing System (MPS) used in British Columbia established competitive market

⁴³¹ Hayden Stmt. ¶¶ 18-19.

⁴³² Ministry of Forests and Range, *Interior Market Pricing System* (June 1, 2006) at CAN-028652 (stating that “the central concept underlying the MPS is that auctions of standing timber establish the market value of the timber and those market values can then be used to determine the stumpage price for the timber harvested under long term tenures.”) (R-140).

prices for the stands, even though the share of Grade 4 timber, priced at \$0.25, has grown.”⁴³³

271. In BCTS timber auctions, the successful bidder is awarded a Timber Sale License (TSL) which conveys the right to harvest a designated stand of timber, with the Grade 1 and 2 timber in that stand priced at the winning bid price per cubic meter, and the Grade 4 timber priced at a pre-set stumpage rate of C \$0.25/m³. As Professors Athey and Cramton explain, it is common to design auctions so that the price of one or more elements of the auctioned parcel are fixed, but so that the final bid price nevertheless will reflect the market value of the entire auctioned parcel through the price bid for the elements that are competitively set at auction.⁴³⁴

272. The BCTS auctions establish a competitively determined market price for the entire timber stand put up for bid. All relevant information concerning the auctioned stands is included in the advertisement inviting bids, and bidders are free to and do examine the stands themselves prior to the bids.⁴³⁵ Through publically available information, bidders can readily track bidding records of similar stands auctioned.⁴³⁶ Bidders must take into account

⁴³³ Athey & Cramton Report ¶ 29 (Ex. R-8).

⁴³⁴ *Id.* ¶¶ 20, 26 (Ex. R-8).

⁴³⁵ Ministry of Forests Official Notices (including detailed maps and cruise data regarding the types and volumes of timber available on stands to be auctioned), General Information Home Page, <https://www23.for.gov.bc.ca/notices/init.do>.

⁴³⁶ *See, e.g.*, Wood X: BC Timber Sale Tracking System, <http://www.woodx.com>.

the full value of the package being auctioned in order to compete successfully with other bidders. In the case of the BCTS stands, the package being auctioned is the right to harvest all the trees in a particular stand of timber.

273. Professors Athey and Cramton note, in particular, that what bidders at these auctions expect to pay is a price equal to the total stumpage rate bid for Grade 1 and 2 timber multiplied by the estimated volume of such timber in the stand, plus the C \$0.25 per cubic metre pre-set stumpage rate for Grade 4 timber multiplied by the expected volume of such timber in the stand.⁴³⁷ What matters to the bidder is the total dollar amount resulting from that calculation, not the nominal prices assigned to each component. Thus, when assessing what price to bid for the Grade 1 and 2 timber component of the stand, the BCTS bidders will incorporate into their bid price for that timber any excess value of the Grade 4 timber in that stand that exceeds the C \$0.25 price for that Grade 4.⁴³⁸ [

]⁴³⁹

274. Bidders who fail to incorporate any excess value of the Grade 4 timber into their bids will not be successful at auctions, and will have to curtail operations and incur

⁴³⁷ Athey & Cramton Report ¶¶ 30, 31 (“The ‘overpayment’ for the sawlog grade balances the ‘underpayment’ for the Grade 4, and the bid itself reflects the true value of the stand.”) (Ex. R-8).

⁴³⁸ See Athey & Cramton Report ¶ 48 (Ex. R-8).

⁴³⁹ [] (Ex. R-2).

shutdown costs. Bidders who incorporate excess value into their bids will be able to secure fibre to maintain operations on a continuous basis. Competition among such bidders ensures that winning bids reflect the market value of the stands. As a result, even if the U.S. had established that some portion of logs graded Grade 4 had been misgraded (and it has not), it still has not established that any benefit would have been provided because the price paid for the stand as a whole would have captured any “excess” value inherent in the misgraded logs.

275. The market-driven value of the right to harvest Grade 4 timber is reflected in the overall price paid for the right to harvest the complete tract or stand including both Grade 1 and 2 timber and Grade 4 timber. Any market value above the pre-set price of Grade 4 timber in the same tract or stand of timber that is auctioned as one indivisible unit will be competitively included in higher prices for Grade 1 and Grade 2 timber.

276. To test empirically whether the excess value of Grade 4 timber is reflected in higher prices for Grade 1 and 2 timber in the same auction stands, Professors Athey and Cramton conducted an analysis of BCTS competitive timber auctions carried out between 2006 and 2010. They asked whether higher winning bids for Grade 1 and 2 timber in those auctions were correlated with greater amounts of Grade 4 in the stands. Professors Athey and Cramton’s regression analysis strongly confirms that higher amounts of Grade 4 in an

auctioned stand correlate with higher bid prices for the Grade 1 and Grade 2 timber in that stand.⁴⁴⁰ The correlation between higher Grade 4 amounts and higher winning auction prices is over 90 percent.⁴⁴¹ Empirical evidence thus confirms that value in excess of C \$0.25 per cubic metre is both captured and transmitted in the sale of timber through the MPS system in the B.C. Interior. While the nominal price of Grade 4 timber is C \$0.25, therefore, the actual price paid for the stand reflects the market value of the stand as a whole.

III. THE UNITED STATES IS NOT ENTITLED TO THE REMEDIES IT SEEKS

277. Canada has explained above why the Tribunal should find that the United States has failed to show that Canada has circumvented the Agreement and accordingly should dismiss the U.S. claims. There should therefore be no need to address the U.S. arguments with respect to what reasonable period of time should be allowed or what compensatory measures would be required if Canada were not already in compliance with its obligations.

278. However, because this proceeding is not bifurcated between liability and remedy, it is necessary for Canada to address the U.S. request that the Tribunal require

⁴⁴⁰ Athey & Cramton Report ¶¶ 65-75 (Ex. R-8).

⁴⁴¹ *Id.* Table A-1 “Regression results (standard errors)” at 16.

Canada to impose an increased tax on exports as compensatory adjustments to compensate for the benefits allegedly received by Canadian lumber producers. Canada's response in this regard is obviously without prejudice to Canada's position that no remedy is warranted because no liability has been established.

279. The remedy proposed by the United States is based on a theory as to the objective of compensatory adjustments which is erroneous and contrary to the text of the Agreement. Canada will explain why this is so at the outset of this section. Canada will then address Dr. Neuberger's Report, the faulty premises on which it is based, and the calculation errors that Dr. Neuberger has made. Finally, Canada will discuss the model that Professor Kalt could construct (based on the model he and Professor Topel, the U.S. economist in the 81010 Arbitration, constructed in the last LCIA circumvention case) that could be used to determine the effect of any benefit on the Export Measures, should the Tribunal find that any of the actions constitute circumvention under Article XVII.

A. ANY COMPENSATORY ADJUSTMENTS MUST BE LIMITED TO THE REDUCTION OR OFFSET OF THE EXPORT MEASURES CAUSED BY BENEFITS PROVIDED IN VIOLATION OF THE SLA

280. The tribunal in the 81010 Arbitration, which adjudicated the prior dispute between the Parties concerning alleged circumvention of the Agreement,⁴⁴² found that it had to decide the dispute “on the basis of the SLA as *lex specialis*” and, as a result, applied the relevant provisions of the SLA, as necessary, in order to decide the applicable remedy for the breaches it had found.⁴⁴³

281. The ordinary meaning of Articles XIV and XVII, in their context, and in light of the object and purpose of the SLA, provide no support for the U.S. demand that compensatory adjustments must be equal to the benefit received by Canadian producers.

282. The text of Articles XIV and XVII makes clear that what must be remedied in a circumvention case is the reduction or offset of the Export Measures caused by the benefits received.

283. Article XIV(22) requires the tribunal to fix a reasonable period of time to cure the *breach* and to determine appropriate adjustments to the Export Measures to compensate

⁴⁴² The earlier arbitral proceeding under the SLA 2006 in LCIA 7941 did not involve Art. XVII, but instead involved a miscalculation of the quota amounts resulting in shipments exceeding the quota limits. See *United States v. Canada*, LCIA Arbitration No. 7941, Award on Remedies (Feb. 23, 2009) (hereinafter “7941 Remedies Award.”) (CA-5).

⁴⁴³ 81010 Award ¶ 109 (CA-6).

for the *breach* if Canada fails to cure the breach within that reasonable period of time. Additionally, the chaussette to Paragraph 23 of Article XIV states that “such adjustments shall be in an amount that remedies *the breach*.”⁴⁴⁴ A remedy, therefore, should not be considered in the abstract, but rather must be tied to the alleged “breach.” The breach claimed by the United States in this case is circumvention under Article XVII.

284. The United States argues that “{t}he centerpiece of Article XVII is the general prohibition on government benefits to the Canadian softwood lumber industry,”⁴⁴⁵ but the United States is incorrect. Paragraph 1 of Article XVII contains the relevant language of prohibition. It provides, in part, that “Neither Party ... shall take action to circumvent or offset the commitments under the SLA 2006, including any action having the effect of reducing or offsetting the Export Measures.”⁴⁴⁶

285. Article XVII is breached, therefore, if an action is taken that has the effect of “reducing or offsetting the Export Measures,” not, as claimed by the United States, if “benefits {are} impermissibly conferred by Canada on its industry.”⁴⁴⁷ Under the plain language of the SLA, the breach of Article XVII is the reduction or offset of the Export Measures resulting from the provision of a benefit, not the provision of the benefit in itself.

⁴⁴⁴ SLA 2006 Art. XIV(23) (Ex. R-1) (emphasis added).

⁴⁴⁵ Stmt of Case ¶ 171.

⁴⁴⁶ SLA 2006 Art. XVII(1) (Ex. R-1).

⁴⁴⁷ Stmt. of Case ¶ 172.

If the compensatory adjustments are to compensate for the uncured breach, they must compensate for the reduction or offset of the Export Measures, not the benefit that produced that result.

286. Accordingly, determining the appropriate compensatory adjustments under Article XIV(22)(b) in an anti-circumvention case is a three-step process. First, the amount of the benefit provided to softwood lumber producers must be calculated. Second, the extent to which the benefit reduces or offsets the Export Measures must be determined. And third, the necessary adjustments to Export Measures to compensate for this effect must be calculated.⁴⁴⁸

287. The tribunal in the 81010 Arbitration rejected nearly identical claims by the United States in that case that the export amounts to be collected should recoup the benefits provided to Canadian softwood lumber producers.⁴⁴⁹ In its award, the tribunal held that “the most appropriate measure for the amounts to be collected as Compensatory Adjustments is not the overall amount of the benefits but only the amounts necessary to neutralize the reduction or offsets to the Export Measures caused by the programs and

⁴⁴⁸ 81010 Tr. vol. 5, 1223:8-16 (Ex. R-141).

⁴⁴⁹ 81010 Award ¶¶ 336, 343-344, 347 (“Nothing in this provision {Art. XVII(2)} suggests that the reduction or offset will necessarily be in the amount of the benefits provided. Whether this is the case is a matter that needs to be decided in light of the circumstances of each case.”) (CA-6).

measures in breach of the SLA.”⁴⁵⁰ The tribunal went on to state that “disregarding the difference between the benefits provided by the programs in breach of the SLA and the offsetting effects of such benefits on the Export Measures would lead to collecting amounts in excess of those needed to restore the level playing field initially established by the Export Measures.”⁴⁵¹

288. Appropriate adjustments to compensate for a breach under Article XVII, therefore, must be set at a level that will neutralize the reduction or offset of the Export Measures caused by the actions found to be in circumvention by the Tribunal. In this case, any reduction or offset of the Export Measures would have to correspond directly to any effect on the U.S. market – such as an increased supply and consequent reduction in prices caused by the breaching programs. It does not, as argued by the United States, correspond to the level of benefit provided by the breaching programs.

289. Even if the breach were considered to be the provision of benefits rather than the effect of those benefits in reducing or offsetting Export Measures, that would not justify the U.S. assertion that the remedy must recoup increased revenues equal to the amount of benefit conferred. The first sentence of Article XVII(2) does not provide that the quantum of reduction or offset of the Export Measures is equal to the quantum of the benefit

⁴⁵⁰ 81010 Award ¶ 348 (CA-6).

⁴⁵¹ *Id.* ¶ 349.

provided. Nor does Article XVII(2) state that a benefit shall be considered to reduce or offset Export Measures in an amount equal to the amount of the benefit. Likewise, paragraphs 22-24 of Article XIV call for adjustments to export taxes or quotas – not for purposes of recoupment or revenue collection, which would require adjustments to be “in an amount that equals the breach” – but rather to have adjustments in “an amount that *remedies* the breach.”⁴⁵²

290. “Compensatory,” as used in Article XIV, has a clear meaning under international law. It addresses the effect of a breach on the claimant state. The ILC Draft Articles, for example, note that “{c}ompensation corresponds to the financially assessable damage suffered by the injured State or its national.”⁴⁵³ Accordingly, “to compensate for the breach” does not mean recouping benefits from the original recipients in Canada (as the United States contends), but rather redressing the effects of the breach on the United States to the extent that the benefits may have offset or reduced the trade protection afforded to U.S. producers by the Export Measures. Regardless of whether the breach is the offset of the Export Measures (as Canada contends) or is the provision of benefits (as the United States contends), the phrase “compensate for the breach” makes clear that the purpose of

⁴⁵² SLA 2006 Art. XIV (23) (Ex. R-1) (emphasis added).

⁴⁵³ ILC Draft Articles, Commentary 4 to Article 36 (RA-1).

the remedy is not to recoup the benefits from private Canadian recipients, even if that were possible, but rather to offset or undo their effect on the injured state.

291. This plain textual reading is supported by the treaty context. Article XIV(22)(b) stipulates that the only remedy that the Tribunal may order is an adjustment to Export Measures – the export taxes or export quotas. The requirement to establish compensatory adjustments means that the SLA confers no authority on the Tribunal to do what the United States says should be done.

292. The United States describes the Export Measures as “a critical part of the benefit for which the United States bargained for in the SLA,”⁴⁵⁴ and acknowledges that the purpose of the Export Measures is to discourage and limit exports of Canadian softwood lumber to the United States.

293. The United States has lauded the award of the tribunal in LCIA Case No. 7941, which emphasized the centrality of the trade restrictions imposed by the Export Measures.⁴⁵⁵ The tribunal’s Award on Liability in the 7941 Arbitration indicated that “the economic effects of the SLA could be considered its object and purpose.”⁴⁵⁶ Similarly, the same tribunal in its Award on Remedy in the 7941 Arbitration indicated that

⁴⁵⁴ Stmt. of Case ¶ 12.

⁴⁵⁵ Stmt. of Case ¶¶ 167, 173.

⁴⁵⁶ *United States of America v. Canada*, LCIA Case No. 7941, Award on Liability ¶ 190 (Mar. 3, 2008) (hereinafter “7941 Liability Award”) (CA-4)

“{e}conomically, in view of the relevance of the economic effect found above to be determinative for the object and purpose of the SLA, the remedy should reduce the actual volume of lumber exported by Canada under current or reasonably anticipated future market conditions.”⁴⁵⁷

294. The United States tries to justify its demand for recoupment of benefits in terms of international law, by referring to the Award on Remedy of the tribunal in the 7941 Arbitration, in which the tribunal noted that “only a remedy that targets and recaptures the impermissible government benefits ‘wipes out’ all the consequences of the breach.”⁴⁵⁸ The tribunal, in the 7941 Arbitration, relied on the Commentary to Article 31 of the ILC Draft Articles on State responsibility referencing the *Chorzow Factory Case* as support for the proposition that the responsible state must endeavor to “wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed.”⁴⁵⁹

295. Neither the 7941 Award nor the *Chorzow Factory Case* supports the U.S. argument. First, the international law standard, as explained and applied by the Tribunal in *Chorzow* and embodied in ILC Article 31,⁴⁶⁰ unambiguously contemplates that it is only the

⁴⁵⁷ 7941 Remedies Award ¶ 329 (CA-5).

⁴⁵⁸ Stmt. of Case ¶ 173.

⁴⁵⁹ 7941 Remedies Award ¶ 275.

⁴⁶⁰ *Id.*

injury to the *injured party* that must be “wiped out.”⁴⁶¹ In terms of the ILC Articles, full reparation for the injury to the Claimant is what is contemplated. Commentary 9 to Article 31 explains that “the subject matter of reparation is, globally, the injury resulting from and ascribable to the wrongful act, rather than any and all consequences flowing from an internationally wrongful act.”⁴⁶²

296. Second, the 81010 tribunal rejected the 7941 tribunal’s reliance on an international law standard other than the SLA in determining the compensatory adjustments to be awarded under the SLA. In discussing whether it was bound by the tribunal’s decision in the 7941 Arbitration, the 81010 tribunal stated:

Moreover, the Tribunal considers that there are strong reasons in favour of a different solution with respect to the relationship between the remedies system set out in the SLA and other rules of international law as well as to the interpretation of the specific provisions of the SLA regarding remedies. Essentially, it sees no basis for applying a presumption of full reparation in the framework of the SLA. It further finds it in conformity with the SLA to focus on the effects caused by the circumvention rather than on the benefits awarded in the course of the circumvention.⁴⁶³

297. There is no support, therefore, in either the *lex specialis* of the SLA or the *lex generalis* of international law for the U.S. contention that a remedy must wipe out all benefits received by Canadian producers. To the contrary, the text of the SLA and customary

⁴⁶¹ *Id.*

⁴⁶² ILC Draft Articles, Commentary 9 to Article 31 (RA-1).

⁴⁶³ 81010 Award ¶ 324 (CA-6).

international law limit any remedy that may be awarded if a breach is found by the Tribunal to compensation for the reduction or offset of the Export Measures.

B. DR. NEUBERGER'S BENEFIT CALCULATIONS ARE EXAGGERATED AND ERRONEOUS

298. The United States claims that B.C. provided a thing of value – Grade 2 logs – to B.C. softwood lumber producers, and then charged those producers too little by misgrading them as Grade 4. The benefit, based on this theory, is the amount by which the value of the logs provided exceeded the amount paid.

299. Accordingly, the Tribunal should have expected to see from the United States evidence and expert testimony on the grading of timber, scaling practices, and the effect on timber value of such characteristics such as moisture content, checking and stain. Such evidence would be necessary to meet the affirmative U.S. obligation to demonstrate that higher-quality logs were misgraded. The Tribunal also should have expected the United States to provide evidence and expert testimony on the payment for timber, particularly on the workings of B.C.'s MPS system, to show that alleged misgrading actually led to underpayment for more valuable timber.⁴⁶⁴

⁴⁶⁴ The burden of proof for these matters falls squarely on the United States. As made clear above, the United States must present evidence to prove the elements of this claim, and must do so with “sufficient evidence”.

300. The United States provided none of this. Instead, the United States relies solely on Dr. Neuberger, both to conclude that misgrading occurred, and to attempt to quantify the amount of alleged benefit provided to softwood lumber producers. The United States instructed Dr. Neuberger to: (1) examine forest industry data and the trend in Grade 4 volumes; (2) assess whether the increase in Grade 4 was attributable to MPB infestation; and (3) analyze if the data or other evidence suggest that logs have been misgraded, and if so, (4) estimate the benefit of that misgrading to Interior B.C. lumber producers.⁴⁶⁵

301. Significantly, the instructions given to Dr. Neuberger by the United States relate entirely to the U.S. inferential case, as do Dr. Neuberger's flawed calculations of the alleged benefit. Dr. Neuberger makes no attempt whatsoever to quantify the benefit resulting from the four so-called actions the United States identifies in its actions case. This dichotomy creates an insurmountable hurdle for the United States claim of circumvention and remedy. Having instructed its expert to calculate a benefit amount only with respect to its inferential case, which establishes none of the requirements necessary to make out a circumvention claim, the United States is left with no legal or factual basis to link the benefits its expert has calculated to any of the so-called actions it claims to have constituted circumvention. Putting this fundamental failing aside, Canada will nonetheless address the deficiencies in Dr. Neuberger's conclusions respecting the inferential case below.

⁴⁶⁵ Neuberger Report ¶ 3 (C-2).

302. Dr. Neuberger's mandate directs him to assume that Grade 4 logs have been misgraded if he, in his examination of the forestry data, cannot fully explain the growth in the percentage of logs graded as Grade 4. For example, to analogize to the antitrust context, it is as if a prosecutor instructs the jury to assume that, if the prosecutor's hired expert cannot fully explain all of the movements in the prices of the defendant's products over some period of time, the jury should assume that these price movements are the result of a conspiracy to fix prices, notwithstanding the absence of any evidence supporting such a conclusion.

303. Dr. Neuberger's report demonstrates that he simply assumed his own conclusion. Dr. Neuberger began with the fact that the percentage of timber harvested in B.C. graded as Grade 4 increased after 2006.⁴⁶⁶ He then undertook to determine whether that increase was attributable to the effects of the Mountain Pine Beetle infestation. He concluded instead that the increase was the consequence of misgrading, on the sole ground that he was unable to explain the increase in the percentage of Grade 4 as the consequence of the infestation.⁴⁶⁷ That is the extent of his inquiry into whether logs were misgraded. Dr. Neuberger made no serious attempt to identify other possible causes of the growth in Grade 4 timber, such as the increase in the average age of MPB-killed timber at the time of harvest,

⁴⁶⁶ Neuberger Report ¶ 14 (C-2).

⁴⁶⁷ Neuberger Report ¶¶ 15-16 (C-2).

or the shift in B.C. policy from containment of MPB infested timber to salvage of MPB-killed timber. He also made no attempt to tie the alleged misgrading to any action of the B.C. government. His conclusion regarding causation is entirely conjectural.

304. The inadequacy of Dr. Neuberger's approach becomes even clearer when the Tribunal considers the extensive evidence offered by Canada's expert witnesses and fact witnesses. They provide evidence that Dr. Neuberger ignored and explain methodological errors that he committed. Dr. Neuberger's errors include:

- Including non-pine species in his analysis, which obscures the true progress of the MPB infestation.⁴⁶⁸
- Resting his conclusions comparing the geographic spread of the infestation to the geographic spread of the Grade 4 harvest on incomplete data, and failing to consider the inventory of dead pine, which is more meaningful than periodic data on pine killed.⁴⁶⁹
- Attempting to assess the extent of misgrading by employing a meaningless statistical test.⁴⁷⁰
- Concluding that the MPB infestation caused no decline in the quality of lumber produced by B.C. sawmills, while ignoring data that directly measure such a decline.⁴⁷¹
- Ignoring the sudden end of the historic upward trend in lumber recovery factors as the MPB infestation caused timber quality to decline, and ignoring the massive

⁴⁶⁸ Kalt Report ¶ 128 and Table 5 (Ex. R-9).

⁴⁶⁹ *Id.* ¶¶ 117-127.

⁴⁷⁰ *Id.* ¶¶ 136-145.

⁴⁷¹ *Id.* ¶¶ 101-104.

investment and operational adjustments that the B.C. industry was forced to undertake simply to maintain lumber recovery levels.⁴⁷²

- Ignoring official data showing an increase in the proportion of logs going to pulp mills, directly contradicting his conclusion on the matter.⁴⁷³

These errors conclusively impeach Dr. Neuberger's conclusions about the causes of the increase in the percentage of Grade 4 pine in the harvest.

305. The shortcomings detailed so far relate to Dr. Neuberger's presumptive conclusion that the growth in the B.C. Grade 4 harvest must be due to alleged misgrading. Dr. Neuberger also fails to establish that B.C. lumber producers paid too little for valuable timber.

306. On this second element, Dr. Neuberger again merely assumes his conclusion. He calculates the alleged benefit by estimating the volume of logs that have allegedly been misgraded as Grade 4, and then estimating the difference between the Grade 4 stumpage price and a constructed price for Grade 1 and Grade 2 logs based on the assumption that bids for sawlogs would be the same in his "but for" case as in the actual situation. He offers no explanation or justification for this assumption.⁴⁷⁴

⁴⁷² *Id.* ¶¶ 63-69, 83-96, 105-107.

⁴⁷³ *See supra* ¶¶ 192-193, Fig. 30.

⁴⁷⁴ Neuberger Report ¶¶ 67-68 (C-2).

307. As Canada has demonstrated, B.C. stumpage rates reflect the market value of entire stands of timber, not individual logs.⁴⁷⁵ Dr. Neuberger failed to appreciate that BCTS bidders already account for the value of Grade 4 timber in their sawlog bids. The fact that these bidders are bidding for entire stands, including Grade 4 as well as the Grade 1 and Grade 2 sawlogs means that any value of Grade 4 above the set C \$0.25 per cubic metre price is captured in the overall auction price of the timber stand.⁴⁷⁶ There is thus no basis to find that any benefit was provided to lumber producers in British Columbia even if the United States had established misgrading which it has not for all of the reasons already discussed.⁴⁷⁷

⁴⁷⁵ See *supra* ¶¶ 62-71.

⁴⁷⁶ See *supra* ¶ 68.

⁴⁷⁷ Neuberger Report [] (C-2). Dr. Neuberger claims that his C \$499.2 million estimate of the benefit from mis-scaled Grade 4 is corroborated by evidence from B.C. []

[]
[] Neuberger
Report [] (C-2). []

]

308. While this alone provides sufficient bases to dismiss Dr. Neuberger's analysis, the calculation errors made by Dr. Neuberger in applying his own incorrect methodology should be noted. First, Dr. Neuberger erroneously assumes that all Grade 4 logs were priced at the minimum rate, despite the fact that the data he uses clearly show that some Grade 4 volume received a price higher than C \$0.25.⁴⁷⁸

309. Second, in his calculation of the benefit to long-term license holders, Dr. Neuberger applies both a "share effect" and an "AMP Effect" as he calls them. However, the share effect is already included within the "AMP Effect" and is therefore double-counted. This also is explained in Professor Kalt's report.⁴⁷⁹

310. Third, in his projections of volumes post 2010, Dr. Neuberger incorrectly assumes that the first half of 2010 is an appropriate basis on which to forecast the remainder of 2010. In this regard, he misses much of the decrease in the volume of timber graded as Grade 4 that is apparent from data for the latter half of 2010.⁴⁸⁰

311. Fourth, Dr. Neuberger presumes that any mis-graded Grade 4 timber would be sold at the average price of Grade 1 and 2 timber without any analysis of the relative quality or market price of such allegedly misgraded timber. As Professor Kalt points out,

⁴⁷⁸ *Id.* ¶ 13 (C-2).

⁴⁷⁹ Kalt Report App. A ¶ 13 at 82 (Ex. R-9).

⁴⁸⁰ *Id.* ¶ 14.

these assumptions are unrealistic, untested and inconsistent with other U.S. claims alleging misgrading.⁴⁸¹

312. These same errors are also present in Dr. Neuberger's calculations with respect to his scenario B – *i.e.*, the benefit calculations using pre-2006 Grade 4 amounts as a baseline to increase the benefit calculation to \$1.1 billion.⁴⁸² However, as neither the United States nor Dr. Neuberger appears to support this grossly inflated benefit scenario, the Tribunal may disregard it.

313. Finally, Dr. Neuberger presents a benefit scenario C that attempts to adjust for the increased intensity of the effect of the MPB attack on timber harvested in British Columbia.⁴⁸³ At the outset, this approach is an admission that the growth in the percentage of Grade 4 is explained at least partially by the effect of the MPB attack. Dr. Neuberger's statistical work on benefit calculations thus contradicts the central premise of his inferential work that only misgrading can explain the growth in Grade 4.

314. Underlying Dr. Neuberger's MPB attack scenario of benefit calculations is his "beta analysis." Dr. Neuberger seeks to infer from extremely limited data the "proper" relationship between Grade 4 and Grey Stage timber at two mills. He then seeks to

⁴⁸¹ Kalt Report ¶¶ 155-157.

⁴⁸² Neuberger Report ¶ 84 (C-2).

⁴⁸³ Neuberger Report ¶¶ 85-92 (C-2).

extrapolate from these results for two mills early in the SLA period to the entire Interior harvest for the period 2007 to 2012. As Professor Kalt explains, the data points on which Dr. Neuberger relies are insufficient to justify the inferences and extrapolations that he makes in his report.⁴⁸⁴ Such assumptions are arbitrary, devoid of any supporting evidence or independent rationale, and may be disregarded.

315. As Professor Kalt points out in his report, Dr. Neuberger's approach to estimating the growth in Grade 4 related to MPB attack has no basis in economics or statistics and has no value in drawing any inference as to the relationship between Grey Stage data and the growth in Grade 4.⁴⁸⁵ Dr. Neuberger's results hinge on his own arbitrary selection of data and parameters. It would be more honest simply to state what he thinks, based on his subjective judgment, than to assert from the data he uses that the growth in Grade 4 can be only partially explained by the increase in Grey Stage timber harvest.

C. NEITHER THE UNITED STATES NOR ITS ECONOMIST HAS SHOWN THAT THE ALLEGED BENEFITS OFFSET OR REDUCED THE EXPORT MEASURES

316. The United States does not allege that the benefits it asserts to have been provided to lumber producers in B.C. have had any effect on the operation of the Export Measures under the SLA. Dr. Neuberger, for his part, only estimates the amount of benefits

⁴⁸⁴ Kalt Report ¶ 135 (Ex. R-9).

⁴⁸⁵ *Id.* ¶ 140.

provided to the B.C. lumber industry, without providing the Tribunal with any analysis of the extent to which the benefits reduce or offset the Export Measures. While Dr. Neuberger's analysis of benefit is fundamentally flawed and incorrect, his analysis of the extent to which those benefits reduced or offset the Export Measures is non-existent. The United States, therefore, has not provided the Tribunal with the input it would need to calculate an appropriate remedy, should the Tribunal find that any action of British Columbia's had circumvented the Agreement. A further submission would be required to address the issue of the appropriate compensatory adjustments. Canada, and its economist Professor Kalt, are prepared to make such a submission if the Tribunal requires it.

317. Professor Kalt has provided the Tribunal with the economic underpinnings of an approach to remedy that is consistent with the language of the SLA 2006 as well as basic economics notions of how export taxes affect markets.⁴⁸⁶ These principles dictate that, if the Tribunal finds that B.C. has provided benefits to the B.C. lumber industry, the remedy for the United States should be the adjustment to the export taxes that restores the U.S. lumber industry to the position it would have been in absent the effect of these benefits.

⁴⁸⁶ *Id.* ¶¶ 171-173 and n.168.

D. COMPENSATORY ADJUSTMENTS MUST COMPENSATE FOR A REDUCTION IN U.S. PRICES CAUSED BY THE BENEFITS RECEIVED BY SOFTWOOD LUMBER PRODUCERS

318. In the event that the Tribunal determines that certain actions have circumvented the SLA, the Tribunal should assess the extent to which the benefits have resulted in increased exports of lumber to the United States, such that the Export Measures provide less of a restraining effect than intended by the SLA. The compensatory adjustments to the Export Measures are designed to compensate the United States for the economic harm it may have suffered as a result of the alleged circumvention of the SLA due to asserted timber underpricing in British Columbia. The only way to assess the extent of harm the United States may have suffered is to look at the economic consequences of the alleged circumvention on the United States, and in particular its lumber producers or exporters.⁴⁸⁷

319. To assess the extent of these economic consequences, it is necessary to conduct an economic analysis of the effects of the alleged timber mispricing and whether this resulted in additional lumber production in B.C., whether that may have resulted in increased exports to the United States, and whether they resulted in lower prices there. Through a careful modeling of the economic effects of the increase in lumber exports, Professor Kalt could provide the Tribunal with his assessment of the damages, if any, that

⁴⁸⁷ 81010 Award ¶ 348 (CA-6).

the United States lumber industry may have suffered and the compensatory adjustments that would result in a return of the U.S. industry to the state of affairs that would have ensued absent the breach using the model that he and Professor Topel, the U.S. economist in the 81010 Arbitration, developed for that purpose.

320. To provide the Tribunal with appropriate estimates of the adjustment to export taxes that would be needed in the event the Tribunal finds that Canada has circumvented the Agreement, Professor Kalt is willing to adapt the model used in the 81010 Arbitration to fit the parameters of this dispute and file a further submission in this regard. The resulting model would be a dynamic simulation model. That is, it would be calibrated to the actual circumstances of North American lumber trade and then employed to answer (simulate) “what if” and “but-for” questions.

321. Since available data indicate that the share of the United States lumber market represented by imports from British Columbia *declined* over the relevant period, the Tribunal may assume that it is unlikely that any adverse effect on U.S. markets could be tied to B.C. exports.⁴⁸⁸

⁴⁸⁸ Kalt Report ¶ 33, Fig. 2 (Ex. R-9).

CONCLUSION

322. For all of the foregoing reasons, the claims asserted in the Statement of Case should be rejected, and the Tribunal should enter an award in favor of Canada.

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