BRITISH COLUMBIA

December 21, 2006

Dr. Bruce Fraser, Chair
Forest Practices Board
P.O. Box 9905 Stn Prov Govt
Victoria, British Columbia
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Dear Dr. Fraser:

Re: Recommendations 2, 3 and 4, Special Investigation Report 14

On behalf of the Ministries of Forests and Range and Environment, please accept this letter as government's response to Recommendations 2, 3 and 4 in the Forest Practices Board's special investigation report 14, *Managing Landslide Risks from Forest Practices in BC (July 2005).*

RECOMMENDATION 2

The Ministry of Forests and Range regional offices should establish quantitative criteria for classifying landslide hazard in terrain [stability] mapping. A landslide hazard class should be defined by the probability or expected frequency of landslides per unit area, rather than by a subjective description.

Response by Ministry of Forests and Range

The Forest Practices Board (board) did not include all its observations underlying this recommendation in its report. Based on the ministry's follow-up communication with the board, the study revealed that there are some inconsistencies in the manner that professionals apply available qualitative criteria to assign terrain stability classes for polygons on terrain stability maps. An example would be, for a given map area, the board's observation that one terrain mapper would classify a polygon as Terrain Stability Class III, and another mapper would interpret the stability class criteria differently and classify the same polygon as Class IV. Inconsistent information on terrain stability maps has the potential to affect a licensee's forest development planning decisions about timber harvesting and road building

Ministry of Forests and Range and Ministry Responsible for Housing

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practices, including decisions about whether to conduct a terrain stability assessment. In view of new scientific developments and technical knowledge gained through terrain attribute studies in the Coast Forest Region, the board believes that the application of quantitative rather than qualitative criteria to assign terrain stability classes for polygons on terrain stability maps may improve landslide management. Significant additional research and development, particularly in the Northern Interior Forest Region and the Southern Interior Forest Region, would be needed to establish quantitative criteria for the entire province.

Under the *Forest and Range Practices Act* (FRPA), forest licensees have the obligation to achieve the results set by government. With respect to landslides, section 37 of the Forest Planning and Practices Regulation (FPPR) requires that forest licensees must ensure that their primary forest activity does not cause a landslide that has a material adverse effect in relation to one or more of the FRPA values listed in section 149 (1) of the FRPA. It is the licensees' responsibility to determine how to achieve this result, including the decision to use terrain stability mapping as a planning tool in landslide prevention.

One of the foundational elements of the FRPA policy framework is a reliance on resource professionals to make decisions that will assist licensees to achieve legislative requirements, including meeting the objective of section 37 of the FPPR. It is the ministry's point of view that licensees, together with terrain professionals who prepare terrain stability maps and forest professionals who use and rely on them to make forest management decisions, both inside and outside of government, should assess the value and business interest in moving towards quantitative criteria in selected or all areas of the province. The scope of such an assessment could include an analysis and evaluation of alternative options in the short and long term (e.g., improvements to existing qualitative criteria, development of training initiatives). If warranted, the ministry is open to conducting some future research initiatives that may be required.

RECOMMENDATION 3

The Ministries of Environment and Forests and Range should establish what "a material adverse effect" from landslides would be for each resource value in FRPA -- with public resources it is the role of the government, not individual licensees, to define where the threshold is for a material adverse effect on resources values. It is important to develop criteria for acceptable risk for each of the FRPA values separately.

Response by Ministry of Forests and Range and Ministry of Environment

The policy decision of the Ministry of Forests and Range and the Ministry of Environment is to not define the phrase "material adverse effect." What constitutes a "material adverse effect" is subject to an objective test; although individual licensees may develop their own corporate guidelines for due diligence purposes, they have no authority to define where the threshold is for a material adverse effect on resource values. Based on decisions by statutory decision makers (SDMs), the Forest Appeals Commission, and the courts, a common

understanding will develop of what constitutes a "material adverse effect" on the FRPA values listed in section 149 (1) of the FRPA. This is the same approach taken under sections 35 and 36 of the *Fisheries Act of Canada*. Based on court decisions, there is a reasonably clear understanding of what constitutes a "deleterious substance," "fish habitat," "water frequented by fish," and "harmful alteration."

In the interim, until clarification is provided by SDMs, the Forest Appeals Commission, and the courts, there is some general (interim) guidance provided in the bullets below that can help to determine what is a "material adverse effect" to an FRPA value. The Ministry of Forests and Range will make the following interim guidance available to ministry staff, forest licensees, and SDMs by posting it on its website.

- The phrase "material adverse effect" is not defined in the legislation. In the absence of a definition in the legislation, SDMs, the Forest Appeals Commission and the courts can look to the ordinary definitions or usage of the words in a dictionary. In this case, the first question is whether or not there is an impact from a landslide on an FRPA value. If there is an impact, the second question is whether the impact on the FRPA value is adverse, which of course means that some type of negative impact has happened. The more difficult term to give guidance on is "material." The Oxford Dictionary defines "material" as "serious, important, of consequence." Obviously this excludes trifling or insignificant effects.

- The degree of potential damage to an asset from a landslide event, for example, depends on the robustness or fragility of the asset and its exposure to or protection from the landslide (Wise et al., 2004). The damage effects to an asset can vary between the extremes of no *detectable loss* to *total loss*. As an illustration using a simple damage classification scheme for drinking water, the qualitative descriptions listed as a "moderate" or "high" consequence rating in Table A10.7 of the *Forest Road Engineering Guidebook* (2002) are examples of what would very likely constitute a "material adverse effect" on drinking water. Those qualitative descriptions of damage effects may be a useful guideline for practitioners, but they are, of course, not determinative in any individual case and not intended to capture the full range of damage effects that might be considered a "material adverse effect" on drinking water. Additionally, a "material adverse effect" on drinking water may also mean water that, after a landslide event, does not meet acceptable concentrations of potentially harmful substances as set out in published guidelines (e.g., *Guidelines for Canadian Drinking Water Quality*).

The best approach for licensees to avoid or minimize the frequency and size of potential impacts on an FRPA value from a landslide may be to apply a landslide management system[1] in their forest development planning and operations under FRPA as recommended by the Forest Practices Board in its report. Where licensees choose to conduct terrain stability assessments as part of such a system and as due diligence to meet practice requirements, there is an expectation that Terrain Stability Professionals "will often have to conduct, at minimum, a partial risk analysis (see Wise et al., 2004) to ensure their clients mitigate the potential effects of landslides" (Fannin et al., 2005).

Fannin, R.J., Moore, G.D., Schwab, J.W. and VanDine, D.F. (2005). *Landslide risk management in forest practices.* Proceedings, International Conference on Landslide Risk Management, Vancouver, B.C., Canada, May 31-June 3, pp.299-320., Elsevier.

Wise, M.P., Moore, G.D., & VanDine, D.F. (eds). 2004. *Landslide risk case studies in forest development planning and operations.* B.C. Min. For., Res. Br., Victoria, B.C. Land Manage. Handb. No. 56. 119p., Crown Publications, Victoria, British Columbia ISBN 0229-1622; 56.

RECOMMENDATION 4

The Ministry of Forests and Range should regularly conduct inventories of landslides as part of the Forest and Range Evaluation Program, as there is no FRPA requirement for licensees to report landslides.

Response by Ministry of Forests and Range

As a result of communication between the Ministry of Forests and Range and the board, the ministry understands the board's intent is to recommend a sampling program to address the question of whether licensees' landslide management practices are effective. The board suggested a relatively broad scale program of sampling, such as entire districts in higher risk areas such as the Coast Forest Region or the Kootenays region of BC. The ministry is currently developing a program of landslide inventories as part of the landscape level of the soil disturbance component of the Forest and Range Evaluation Program.

I trust this letter addresses the board's special investigation recommendations. If the board has any questions regarding government's response to Recommendations 2 and 4, please

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[1] Based on the ministry's communication with the board, the board's use of the term "landslide management system" includes three components: terrain mapping, terrain stability mapping, and terrain stability assessments (also known as terrain stability field assessments).

contact Tom Millard, Research Geomorphologist, Coast Forest Region, at 250-751-7115. If the board has any questions regarding government's response to Recommendation 3, please contact Glenn Moore, Senior Structures and Roads Engineer, at 250-387-8331.

Yours truly,

Original Signed by
Doug Konkin
Deputy Minister

Doug Konkin
Deputy Minister

pc: Honourable Rich Coleman, Minister of Forests and Range
Honourable Barry Penner, Minister of Environment
Tim Sheldan, ADM, Operations Division, MFR
Ralph Archibald, Director, Forest Practices Branch, MFR
Dan Graham, Director, Compliance and Enforcement, MFR
Jim Langridge, Director, Resource Tenures and Engineering Branch, MFR
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Forest Practices Board

File: 97350-20/2006-03

September 27, 2007

Doug Konkin
Deputy Minister, Ministry of Forests and Range
3rd Floor – 1520 Blanshard Street
Victoria, BC V8W 3K2

Dear Doug Konkin:

Re: Managing Landslide Risks – Forest Practices Board Recommendations

This letter acknowledges receipt of your letter of December 24th, 2006 regarding the recommendations made in our Forest Practices Board (FPB) Special Report 14, Managing Landslide Risks from Forest Practices in BC.

While your letter argues against accepting most of our recommendations, we accept your response as valid and consistent with the spirit of FRPA. Please be advised that we will be conducting a follow up special project on landslides in 2007, in which we will explore the themes of due diligence and professional reliance further. If your staff has any questions please contact Steve Chatwin (356-1405) for more information on this project.

Yours sincerely,

Bruce Fraser

Bruce Fraser, PhD
Chair

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