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	<b>ATTENTION:</b> REGIONAL EXECUTIVE DIRECTOR, REGIONAL STAFF MANAGERS, DISTRICT MANAGERS & SECTION HEADS			
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**PURPOSE:**

To establish a procedure for the prompt reporting and systematic tracking of landslide and erosion events in the Southern Interior Forest Region.

**REFERENCE:**

Section 45 of the *Forest Practices Code of BC Act* (FPC) refers to the protection of the environment when carrying out forest practices. Specifically, Section 45(3) states that a person must not carry out a forest practice that results, directly or indirectly, in:


- a) slumping or sliding of land;
- b) inordinate soil disturbance; or
- c) other significant damage to the environment.

Should Section 45(3) be contravened, Section 45(4) states the person must stop the forest practice in the area affected, prevent any further damage to the environment, promptly notify the district manager, and take any remedial measures that the district manager requires. For the purposes of this Standard Operating Procedure, events requiring prompt notification of the district manager are referred to as reportable events.

For areas managed under an approved Forest Stewardship Plan, Section 46 (1) of the *Forest and Range Practices Act* (FRPA) indicates that a person must not carry out a forest practice, a range practice, or other activity that results in damage to the environment, if that person knows, or can reasonably expected to know, that because of weather or site factors, that the practice may cause damage specified by regulation. A “forest practice” includes among other things timber harvesting, road construction, road maintenance, road use, and road deactivation. In addition, Section 37 of the *Forest Planning and Practices Regulation* (FPPR) indicates that a person who carries out a primary forest activity must ensure that the primary forest activity does not cause a landslide that has a material adverse effect on a subject referred to in section 149(1) of the Act (objectives set by government). A “primary forest activity” is defined in regulation to include timber harvesting, silviculture treatments, and road construction, road maintenance, and road deactivation. A person who contravenes section 46(1) must take appropriate action to prevent any further damage, promptly notify the district manager of the damage, and take any remedial measures that the minister requires under Section 74.

A landslide is “a movement of a mass of rock, debris or earth down a slope” as defined by Cruden (1991) and as referred to in the publication *Landslide Risk Case Studies in Forest Development Planning and Operations*, published by the British Columbia Ministry of Forests (Wise, *et al.* 2004).

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**SCOPE:**

A reportable event is a landslide or erosion event that satisfies one of the three categories in FPC Section 45 (3), or causes damage to the environment in FPC Section 45 (1) or FRPA Section 46 (1), or has a material adverse affect as described in FPPR Section 37. For practical purposes, a reportable event should be defined as:

- 1) Landslide(s) of any type having impact outside of a forestry road clearing width as a result of forest practices or any other developments on Crown Land;
- 2) Erosion, flooding, or slumping causing serious damage to a forestry road which requires repair above and beyond what would be considered routine maintenance or that results in significant sediment delivery to water courses;
- 3) Any landslide, erosion, or flooding event that either has an impact on sediment loading to watercourses or causes significant damage to operable forest; and,
- 4) Snow avalanches which originate in Crown land clear cuts and cause damage to roads, forests, plantations, or other resources.

**PROCEDURE:**


**Reporting Responsibility**

The primary responsibility for the reporting of an event is:

- I) Licensees where: the event is in an area (within area-based tenures or operating areas within the area under an approved Operational / Site Plan or Forest Stewardship Plan – excluding roads where the licensee has not been delegated the responsibility for maintenance) that may be affected by forest development.
- II) The Ministry of Forests (MoF) as follows:
  - i) Field Services, where the event is on Vacant Crown Land or if the event may have been caused by an FSR (where there has been no delegation of maintenance responsibility).
  - ii) BC Timber Sales (BCTS), where the event is in a BCTS operating area (excluding roads where BCTS does not have delegated responsibility for road maintenance) or may have been caused by a BCTS forest practice or primary forest activity.

It should be noted that regardless of primary reporting responsibility, MoF or Licensees should report any known events as discovered. The reporting of a landslide by no means implies an admission of contravention or responsibility under Section 45 of the FPC, Section 46 of FRPA, or Section 37 of FPPR.

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### Regional Landslide and Erosion Control Team

The Regional Executive Director will establish a Regional Landslide and Erosion Control Team made up of specialists from various government agencies. The Regional Landslide and Erosion Control Team will:

- be established to deal with the technical aspects of landslide, erosion, and sedimentation control, prevention, and mitigation;
- respond to reports of landslide and erosion events requiring immediate investigation and attention;
- assist the Districts with landslide and erosion mitigation and landslide risk analyses and assessments;
- where required, develop measures and prescriptions for long-term stabilization and access, e.g. re-establish road subgrade on terrain with a moderate or high likelihood of landslides adjacent to streams/rivers or other resource values where appropriate erosion control is required; and,
- provide annually a list of primary Regional Landslide and Erosion Control Team contacts.


### District Landslide and Erosion Response Plan

The District Manager will develop and implement a District Landslide and Erosion Response Plan to ensure a state of readiness to respond to landslide and erosion events. As part of the plan, a District Erosion Officer and / or alternates will be designated who will co-ordinate the reporting and necessary immediate or emergency action. The District Landslide and Erosion Response Plan should include:

- level of preparedness based on landslide, erosion, and flood hazard;
- lists of personnel to respond (including designated District Erosion Officer) and relevant recall/overtime procedures;
- list of on-hand equipment and supplies and list of locally available construction equipment and suppliers to deal with events requiring immediate stabilization or remedial measures;
- licensee and ministry contacts;
- other government contacts – Ministries of Water Land and Air Protection (MoWLAP), Ministry of Transportation (MoT), Provincial Emergency Program (PEP), Ministry of Energy and Mines (MoEM), Fisheries and Oceans Canada (DFO), First Nations, and criteria for contact;
- media contact person (usually District Manager); and,
- other contacts (utilities, railways, water-users, etc) and criteria for contact.

Erosion events will be reported to the District Erosion Officer within 24 hours of discovery where communication is available. The Landslide and Erosion Report Form (see below) should be used for reporting purposes.

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### Emergency Situation

When an event impacts public safety, results in damage to major public infrastructure or results in an imminent threat to public safety or infrastructure, the District Erosion Officer shall immediately notify the Provincial Emergency Program (PEP) at 1-800-663-3456. The District Erosion Officer will also immediately forward an Early Warning Note (copy attached) to the ADM Operations and the Provincial Issue Response Co-ordinator (copies to the District Manager and Regional Executive Director) in the event of:

- loss, or imminent loss, of life;
- damage, or imminent damage to occupied private property, utilities or infrastructure; or
- substantial environmental damage.

In such an emergency situation, the District Erosion Officer or Licensee will:


- notify the Regional Landslide and Erosion Control Team;
- determine the responsibilities and action required;
- direct or undertake immediate action as defined in the District Landslide and Erosion Response Plan;
- as stated above, notify PEP at 1-800-663-3456 if the emergency requires the mobilization of additional resources, public warnings, search and rescue, or the implementation of other agency emergency plans; and,
- where necessary, set up an interagency team to determine the appropriate course of action, determine the cause, and provide recommendations for the prevention of similar events.

### Notification of Other Ministries / Agencies

Notification of significant erosion events to other ministries is required under certain circumstances. If the erosion event has impacted, or has the potential to impact a stream, lake, or riparian area, e.g. resulted in or could potentially result in the deposition of soil (clay, silt, sand, gravel, or rock) or other debris into a stream, lake, or riparian area, then MoWLAP (Environmental Protection Division) and the Conservation Officer Service (CO) should be contacted as soon as possible by the person reporting an event. In an emergency, the 24-hr contact number for the Conservation Officers is 1-800-663-9453. If appropriate or required, MoWLAP will notify Fisheries and Oceans Canada.

Likewise, if MoWLAP is aware of an event that pertains to the Ministry of Forests, the Environmental Protection Division should notify the associated Designated District Erosion Officer when public safety is a concern. A similar communication procedure should be arranged with the Ministry of Transportation (MoT) and the Ministry of Energy and Mines (MoEM) in the District Landslide and Erosion Response Plan.

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For landslides that originate on Crown land and have impact on either streams, lakes, community watersheds, or a highway then it may be economical and efficient to organize a joint agency field review (MoWLAP and/or MoT) to perform an initial assessment to determine cause, responsibility, and mitigative measures.

**REPORTING REQUIREMENTS:**

A Landslide and Erosion Report Form and the Landslide and Erosion Event Database have been developed to facilitate reporting, assessing, and prioritizing of landslide and erosion events. Both are described below. At times a more detailed professional landslide and erosion investigation and report is required, as discussed below.

**Landslide and Erosion Report Form**

This form is to be used by district and licensee staff whenever a reportable event has been identified. The intent of the form is to identify that an event has occurred, where it occurred (include a map with map sheet number identifying road name and km, and location including UTM with zone number), the type, size, and likely cause of the event, and an indication of the impact of the event. Include photos and sketches if possible. Land Management Handbook 18 (Chatwin *et al.*, 1994) can be used as a reference for determining the type of event. The user should complete the form thoroughly; if any item is unknown then state as such. The user should also identify on the form what other agency contacts were made and what actions have been taken and what further actions are required.


The form should be forwarded to the designated District Erosion Officer within 24 hours (if not completed by the district). Where the event is causing or has the potential to cause infrastructure damage or serious environmental damage, the district should immediately contact a member of the Regional Landslide and Erosion Control Team.

Copies of the Landslide Erosion Report Forms and any accompanying information should be forwarded to the Regional office or designated Regional Landslide and Erosion Control Team person on a regular basis.

**Professional Landslide / Erosion Investigation**

In areas where significant environmental damage has occurred, where infrastructure has been damaged, where private property has been impacted, where a C&E case file may be opened, or where a significant on-going risk exists, then an investigation of the landslide, its cause, and possible mitigation strategies. A qualified registered professional specializing in landslide investigation and mitigation shall complete a Professional Landslide / Erosion Investigation.

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### Landslide and Erosion Event Database

This Access® database will be used by the District Erosion Officer, the Regional Landslide and Erosion Control Team, and Regional and District Management to track events throughout the Southern Interior Forest Region. When an event is reported to the district, the District Erosion Officer will update the database within 48 hours. The database internally assigns a unique number to each event, but the person entering the event details can assign a unique name identifying each landslide. The information must contain the event location (including UTM co-ordinates), size, damage, impact, the cost of repair, whether an Early Warning Note will be filled out, and actions completed to date and planned (the database will prompt for all the required information).

### Event Sign Off

Once all the action items associated with any event are complete, the event must be signed off as provided for in the Landslide and Erosion Event Database. The District Erosion Officer should sign off the event. Long-term monitoring of an event (for example: to ensure adequate re-vegetation) is not considered an action item, therefore the event can be signed off even though continued monitoring is in place. Outstanding C&E related issues are also not considered action items unless there may be a requirement for further site remediation.

### REFERENCES:

- Chatwin, S.C., Howes, D.E., Schwab, J.W., and Swantson, D.N. 1994. *A Guide for Management of Landslide-Pone terrain in the Pacific Northwest*. 2<sup>nd</sup> Ed. BC Ministry of Forests. Research Program. Land Management Handbook No. 18. ISSN 0229-1622.
- Cruden, D.M. 1991. *A simple definition of a landslide*. Bulletin of the International Association of Engineering Geology. No 43, pp. 27-29.
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### APPROVED:

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