

Management guidelines for private native forests and plantations

Code of Practice for Timber Production 2014



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Definitions

In these guidelines, unless the context requires otherwise, the following words and phrases in bold have the following meanings.

‘action statement’ means a document made under section 19 of the *Flora and Fauna Guarantee Act 1988*.

‘code’ means the *Code of Practice for Timber Production 2014*.

‘cording’ means log material—eucalypt and non-eucalypt—with a diameter greater than 15 cm placed in a corduroy fashion on landings and snig tracks to distribute machine loading over a larger area.

‘designated crossing’ is where the location for the crossing of a waterway has been specifically identified on a Timber Harvesting Plan, other operational plan or in the field, and is constructed or installed in a manner that allows for typical peak annual flows. It may be a permanent crossing, a temporary crossing, or a crossing segment on a drainage line.

‘disturbance’ means to inflict changes to particular characteristics of an ecosystem (such as waterways, riparian vegetation or the linkages between the waterway and the catchment).

‘landowner’ means the person who is the owner or authorised occupier of freehold land.

‘log dump’ is an area where logs are stockpiled prior to transport from the plantation. A log dump requires no clearing or earthworks (as distinct from a landing, as defined in the code). In many plantations, roadside firebreaks and verges are used as log dumps and there may be many small dumps located along sections of major plantation roads where there is space to stack logs. Under the code, a landing is a place where logs are sorted, processed or loaded, so if the intention is to load logs from log dumps, then they should be considered as landings.

‘maintained’ means to enable continuation of the current conditions and functions of biological diversity.

‘mass movement’ means the collapse or downhill slippage or movement of soil and rock where gravity is the primary force. It generally occurs on steep slopes where soil and rock strata are naturally unstable, or have been made unstable by human activity or a natural agent such as fire, and is often triggered by an extreme weather event.

‘matting’ is smaller head material (branches), bark or other vegetation that is used to cover cording on snig tracks and landings.

‘retained native vegetation’ means native vegetation that must be retained under planning scheme provisions (including clause 52.17) or planning permit conditions; or native vegetation that the plantation / landowner chooses to retain, in addition to any statutory obligations.

‘risk’ means the potential outcome of a specific hazard. It defines the possibility of injury, illness, damage or loss occurring as a result of that hazard. It is measured in terms of likelihood and consequence.

‘risk assessment’ involves examining and evaluating the likelihood and possible consequence(s) (severity) of the potential outcomes of hazards in order to prioritise risks, which then govern management control measures.

‘road construction’ means works that involve the construction of a new section of road, or a new road.

‘soil disturbance’ means the disruption of the soil profile to an extent that affects its productivity and water relations, potentially leading to the protracted deterioration of water quality and aquatic health in associated streams.

‘temporary crossing’ is a waterway crossing constructed or installed for a particular short-term phase of plantation operations, and designed for removal following completion of the operations that it was meant to service.

‘temporary road’ means a road or track and any associated bridges, crossings and culverts that does not form part of the permanent road network. A temporary road is mostly constructed for the purpose of accessing a coupe(s) (or part thereof) to undertake timber harvesting operations and will be closed and rehabilitated on the completion of timber harvesting operations in that coupe(s). A temporary road includes in-coupe roads and coupe driveways.

‘wildlife’ as defined in the *Wildlife Act 1975*.

Any other term has the meaning as expressed in the code, unless otherwise specified.

Acronyms

AMG	Australian Map Grid
CFA	Country Fire Authority
CHMP	Cultural Heritage Management Plan
CMA	Catchment Management Authority
DEPI	Victorian Department of Environment and Primary Industries
DPI	Victorian Department of Primary Industries (now DEPI)
EPA	Environment Protection Authority
EVC	Ecological Vegetation Class
FMA	Forest Management Area
LGA	Local Government Authority
NRE	Victorian Department of Natural Resources and Environment (now DEPI)
PDN	Plantation Development Notice
THP	Timber Harvesting Plan

1. Introduction

1.1 Scope

These management guidelines apply to all commercial timber production where the Code of Practice for Timber Production 2014 (the code) applies on private land (as defined in section 52.18-2 of the Victoria Planning Provisions).

1.2 Role

This document provides guidelines to:

- timber production managers and operators, to interpret the provisions of the code
- local governments, which have responsibility for monitoring code compliance under Victorian planning schemes.

These guidelines are not a substitute for the mandatory actions specified in the code.

Where there is a conflict between the code and these guidelines, the code prevails.

1.3 Application

Guidelines provide possible means for achieving operational goals or mandatory actions, including reference to documents that may assist forest managers.

Forest managers and operators are not obliged to conduct any of the actions under **management guidelines** in the following tables.

Failure to follow the management guidelines does not in itself constitute non-compliance with the code. However, the guidelines generally support or expand on the operational goals and mandatory actions in the code.

1.4 Review of guidelines

The Department of Environment and Primary Industries (DEPI) may conduct a review of these guidelines when:

- a statute is created or changed
- the code is revised
- an **action statement** and/or flora and fauna guarantee order made under the *Flora and Fauna Guarantee Act 1988* is created or changed
- another subordinate instrument is created or changed
- there is new scientific knowledge.

The Secretary of DEPI may review these guidelines at any time, and make changes as required to improve the environmental performance of timber production on private land.

These guidelines are valid until completion of a review, or until otherwise notified by the Secretary.

2. Explanatory notes

Chapters 3 and 4 that follow set out, in table form:

- clauses of the code (in the left-hand column)
- corresponding management guidelines (in the right-hand column).

The headings and numbers in the table correspond with the numbers in the code.

The left-hand column does not contain all elements of the code, and is therefore not a substitute for the code.

If a word from the guidelines glossary appears on a page it has been highlighted in bold.

As far as possible, the guidelines link to the relevant clauses of the code. However, some guidelines may be more broadly applicable to other clauses. In some instances, guidelines may be repeated.

Guidelines provide a possible means of meeting the requirements of the code. They do not exclude actions not listed, as long as they meet the requirements of the code.

Chapter 5 identifies some Victorian or Commonwealth laws that may be particularly relevant to an activity. These laws do not form part of the code, but alert the forest operator to other laws which they must follow. The list may not be comprehensive, and obligations may change. It is the responsibility of the forest operator to ensure all relevant legal requirements are met. Local governments are not responsible for compliance with laws outside their statutory responsibility.

3. Management guidelines - private native forests

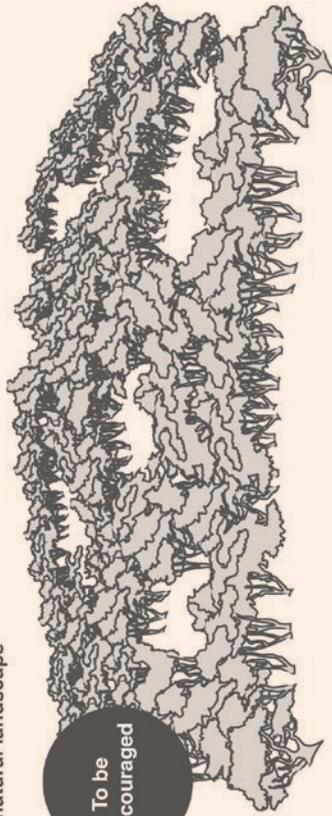
Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
<h3>3.1 Forest planning</h3>	<p>'Permitted clearing of native vegetation – Biodiversity assessment guidelines (2013)' is available on the Department of Environment and Primary Industries' website.</p>
<p>Proper planning is critical to achieving timber production requirements and the environmental outcomes encompassed by the code. Forest management planning provides clear documentation of intended reservation of areas, measures to protect the environment and proposed timber production operations.</p>	
<p>Under the requirements of planning schemes, timber production on private land must comply with the code. Local government (the responsible authority) is required to consider the operational goals and mandatory actions in this code when issuing permits for timber production.</p>	
<p>Private native forest harvesting must be in accordance with 'Permitted clearing of native vegetation – Biodiversity assessment guidelines (2013)', an incorporated document in the Victoria Planning Provisions and all planning schemes.</p>	
<p>Operational goal</p> <p>Approval for timber production in native forest on private land is obtained through the relevant planning scheme.</p>	
<h4>3.1.1 Timber harvesting plan</h4>	
<p>A Timber Harvesting Plan is the basic record of the forest manager's intended activities in an area of forest. It applies to a single coupe, a number of coupes or to an area in which a number of coupes are to be harvested. It assists timber harvesting managers, harvesting entities and operators and local government in understanding and assessing:</p> <ul style="list-style-type: none"> i. area to be harvested and operational requirements; ii. compliance with the operational goals and mandatory actions of this code; iii. compliance with the planning scheme requirements; and iv. compliance with relevant legislation. 	
<p>Operational goal</p> <p>A Timber Harvesting Plan is prepared in accordance with the requirements of this code and submitted to the relevant local government prior to the commencement of timber production.</p>	

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
Mandatory actions		
3.1.1.1	A Timber Harvesting Plan must be submitted to local government not less than 28 days before the commencement of any timber production operations. The 28 day minimum lodgement time may be waived with the agreement of the local government.	A local government authority (LGA) may accept the lodgement of an annual Timber Harvesting Plan (rather than Timber Harvesting Plans for individual coupes) if it is satisfied that the annual Timber Harvesting Plan adequately covers the information required for all coupes included in the plan.
3.1.1.2	A Timber Harvesting Plan is current for 24 months following lodgement with the local government.	
3.1.1.3	When preparing a Timber Harvesting Plan, the following issues must be addressed: <ul style="list-style-type: none"> i. methods to minimise impacts on biodiversity, water quality and river health from timber production; ii. ways to minimise impacts on significant visual landscape values and; iii. ways to minimise impacts on cultural heritage values. 	<p>The Timber Harvesting Plan may include consideration of any objectives of regional river health strategies, sustainable water strategies or any water-quality plans prepared by the CMA or water authorities.</p> <p>Maintaining an appropriate age class distribution will protect water availability, utilising techniques such as the adoption of longer rotations, limitations on annual harvest areas, controlling stand density by thinning to maintain streamflow, or other techniques as research knowledge becomes available. In determining which techniques may be appropriate to protect water availability in any area, consideration should be given to the forest types and age classes present, and to existing water yields.</p> <p>Local government and other government authorities (such as catchment management authorities) may provide advisory information to assist landowners develop and implement plans to protect forest values identified as important at the catchment level.</p> <p>The location and design of the coupe should take account of the type of harvesting equipment to be used.</p> <p>Adverse visual impacts can be minimised by appropriate modification of coupe design and distribution. The objective is to blend harvesting scenes with natural features of the landscape, and particularly to minimise skyline impact (as shown in Figure 1).</p>

Figure 1: Minimising visual impact

Small curvilinear shaped coupes create minimal visual impact as they blend with the natural landscape

To be encouraged



Sequencing of harvest operations over time reduces their visual impact

Large geometrically shaped harvest areas create unsightly contrasts with the natural forms and lines of the landscape

To be avoided



Harvest areas which breach the horizon create unsightly skyline impacts

Code clauses (*Explanatory statements, operational goals or mandatory actions*)

Management guidelines

<p>3.1.1.4 The Timber Harvesting Plan may also include:</p> <ul style="list-style-type: none"> i. landowners name and address; ii. estimated timber volumes to be harvested; iii. the proposed haulage route; iv. a map showing: <ul style="list-style-type: none"> - the coupe location(s); - the area(s) to be harvested; - areas excluded from harvesting within the coupe boundary, including areas reserved or specifically managed for biodiversity conservation, waterway protection (including any buffers or filter strips), or protection of cultural heritage values; - power lines; - new or upgraded roads and coupe infrastructure within the property. v. conditions applying to the timber production operation; vi. fire protection measures; vii. the period during which the operation is to occur; and viii. a regeneration program to follow harvesting, where required. 	<p>The Timber Harvesting Plan may additionally include information on:</p> <ul style="list-style-type: none"> • methods of marking; • the soil erosion hazard class (or classes) of the coupe area and associated operational restrictions (such as slope); • the harvesting and regeneration systems to be employed; • areas within or adjacent to a coupe that are to be excluded from harvesting, or to which special prescriptions apply (such as for biodiversity protection, habitat enhancement or landscape protection) and details of any special conditions or prescriptions appropriate to protecting those sites; • measures to be employed to protect and rehabilitate soils and to ensure maintenance of water quality; • the location, design, construction, maintenance and closure of log extraction roads; • the locations and methods of rehabilitation of log landings and dumps and, where necessary, siting and rehabilitation measures for major snig tracks; • seasonal restrictions; • any required vegetation offsets.
<p>3.1.1.5 The size of clearfall, seed tree harvesting or shelterwood coupes should generally not exceed 40 hectares net harvested area. Coupes may be aggregated but not exceed 120 hectares net harvested area over a period of up to five years. Aggregated coupes must not be contiguous (forming a coupe greater than 120 hectares within a five year period).</p>	
<p>3.1.1.6 Thinning coupes must not exceed 120 hectares net harvested area. Single tree selection coupes may be of any size, where landscape or environmental values are not affected.</p>	
<p>3.1.1.7 Coupe boundaries must take advantage of topographic and/or artificial features (such as roads and property boundaries) where they exist, with due regard to safety, operational requirements, landscape values and environmental values. Where coupe boundaries do not follow obvious natural or artificial features, they must be clearly marked on-site.</p>	
<p>3.1.1.8 Characteristics of coupes for salvage of timber in forests damaged by fire, pests, pathogens or other events may differ from undamaged forests. A special (salvage) plan or an amended Timber Harvesting Plan must be developed, taking into account:</p> <ul style="list-style-type: none"> i. the need for urgency in timber recovery; and ii. the need to modify prescriptions, as required, to meet environmental care goals and address recovery strategies for other forest values (such as fauna). 	
<p>3.1.1.9 Salvage harvesting operations must take as much account of environmental care as any other harvesting operation.</p>	

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)	Management guidelines
3.1.1.10	A copy of the Timber Harvesting Plan and any supporting prescriptions must be provided to the harvesting team leader. The plan's implementation, including specific prescriptions to be applied to the coupe, must be discussed with him/her. These documents must be available on-site while operations are in progress.
3.1.1.11	All amendments and variations to operational requirements (such as the removal of trees from buffers or outside the coupe for safety purposes) must be documented in the Timber Harvesting Plan and dated by the harvesting team leader.
3.2 Environmental values in Private Native Forests	
	Timber production operations in private native forests may impact on environmental values such as water quality and biodiversity. Appropriate planning and management through the lifecycle of the operation can minimise these impacts. This section includes requirements that must be observed during planning, tending, roading, harvesting and regeneration of native forests on private land.
3.2.1 Water quality, river health and soil protection	
Operational goals	
	Water quality and river health are maintained or improved by protecting waterways and aquatic and riparian habitat from disturbance.
	Water pollution is minimised and soil productive capacity is maintained by avoiding harvesting in inappropriate areas or slopes and undertaking necessary preventive measures.
	Chemicals are only used where appropriate to the site conditions and is conducted with due care for the maintenance of forest health, water quality, biodiversity and soil values.
	During or following wet weather conditions, timber production is modified or where necessary suspended to minimise risks to soil and water quality values.
Mandatory actions	
Waterway classification	
3.2.1.1	Use the following categories when determining buffer and filter widths for waterways within and immediately adjacent to each coupe: <ul style="list-style-type: none"> i. permanent streams, pools and wetlands; ii. temporary streams; iii. drainage lines. Aids to the identification of each class of waterway are provided in the glossary

Protecting waterways and aquatic and riparian habitat

3.2.1.2 Management actions to protect waterways, river health and soil must be appropriate to the waterway class, soil category, and potential water quality risk posed by timber production at each site.

3.2.1.3 Water quality and river health must be protected by establishing and maintaining buffers and/or filter strips (to each side of the waterway). Buffers and filter strips must be specified on the basis of field risk assessments, and the outcomes shown in the Timber Harvesting Plan. As part of the field risk assessment, the potential risk to water quality is determined through consideration of:

- soil erodibility
- soil permeability
- rainfall erosivity (including season of timber production operation)
- topography
- type of timber production operation
- location of coupe infrastructure.

3.2.1.4 Water quality and river health must be protected from microclimate changes, sedimentation and disturbance by maintaining buffers and/or filter strips (to each side of the waterway) of not less than the widths specified in Table 1 (note: this is Table 2 in the code).

Table 1: Minimum widths in metres for buffers and filter strips applicable to various waterway categories, in relation to water quality risk and slope

Waterway class	Sites with low or moderate water quality risk		Sites with high or very high water quality risk	
	Slope 0-30o	Slope 0-20o	Slope 21o - 30o	
1. Pools, permanent streams and wetlands	20m B	30m B	40m B	
2. Temporary streams	10m F	10m B + 10m F	20m B	
3. Drainage lines	10m F	10m F	15m F	

Water quality risk assessment and protection

The following must be determined in the field:

- soil erosion classification;
- soil permeability classification.

Appendix 1: Soil erosion hazard and soil permeability field guide and assessment kit provides guidance on the assessment of soil erosion classification and soil permeability.

Combine the soil erosion and soil hazard classifications to determine an overall soil category of low (L), moderate (M), high (H) or very high (VH) as shown in Table 2 below.

Table 2: Determining overall soil category

Soil permeability classification	Soil erosion classification			
	Low	Medium	High	Very high
Low	M	M	H	VH
High	L	L	M	M

Use this overall soil category to determine water-quality risk as shown in Table 3.

Table 3: Translating overall soil category to water-quality risk

Overall soil category	Water quality risk
L	Low water quality risk
M	Moderate water quality risk
H	High water quality risk
VH	Very high water quality risk

Use this overall water-quality risk category to help determine the width of buffers and filters in Table 2 in 3.2.1.4 of the code (Table 1 opposite).

Directing trees to fall out of filter strips may reduce **soil disturbance**.

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
3.2.1.5	<p>Additional measures to protect water quality and aquatic habitat (including widening buffers or filter strips) must be adopted within coupes where there is a high local risk due to:</p> <ul style="list-style-type: none"> i. local topography ii. the intensity and magnitude of the harvesting operation; or iii. the location of the timber production operation in a declared Special Water Supply Catchment or any other water supply protection area. 	<p>Additional protection measures to protect waterways may include additional buffers and filter strips, or modified harvesting within parts of a coupe.</p> <p>Logging techniques specifically designed for steep slopes (such as cable logging) may be used to minimise soil movement.</p> <p>Other special requirements for water quality and soil protection may be set out in a regional river health strategy, or a water-quality plan prepared by the relevant Catchment Management Authority (CMA) or Melbourne Water. These plans may provide guidance on additional protection measures.</p>
3.2.1.6	To the maximum extent possible, exclude roads and snig tracks from aquatic and riparian habitats.	
3.2.1.7	Where crossings are required, minimise the extent of habitat damage, constriction to stream flow and barriers to fish and other aquatic fauna.	For guidance, see <i>fish passage requirements for waterway crossings</i> (NSW Fisheries 2003), at http://www.dpi.nsw.gov.au/_data/assets/pdf_file/0004/202693/Why-do-fish-need-to-cross-the-road_booklet.pdf
3.2.1.8	Remove temporary crossings immediately after harvesting or any subsequent regeneration work for which they are required using a technique that minimises soil and habitat disturbance.	
Minimising water pollution		
3.2.1.9	Use drainage, artificial structures, buffers and filters of effective width to slow and disperse surface flows and deposit sediment before reaching waterways.	
3.2.1.10	Unless otherwise approved on the Timber Harvesting Plan, locate coupe infrastructure, roads and other activities that generate sediment and other potential pollutants in places where risk of entry into waterways is lowest.	Waste oil, all empty drums, discarded machinery parts and other waste must be removed from the forest. There may be special disposal facilities available for disposal of such items.
3.2.1.11	Minimise the extent and duration of soil disturbance adjacent and within waterways.	Appropriate Australian standards for the storage and handling of fuels, such as AS1940, provide detailed practical guidance to minimise the risk of fuel spills.
3.2.1.12	Use management practices such as modified harvesting techniques, scheduling, wet weather suspensions or progressive rehabilitation to minimise potential for sediments and other pollutants to move into streams.	
3.2.1.13	Design, construct and maintain roads, crossings, coupe infrastructure and drainage structures to withstand anticipated rainfall events and traffic conditions, and protect water quality.	

Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
<p>3.2.1.14 Ensure chemical use is appropriate to the circumstances and takes into account the maintenance of water quality.</p>	<p>Where pesticides are used, a pesticide application plan may be prepared that specifies the target pest(s), chemical(s), target area(s), application rate(s) and method(s) and operational control(s) that will be adopted to minimise unintended off-target and off-site impacts, in accordance with the product label.</p> <p>The factsheet <i>Herbicides: guidelines for use in and around water</i> prepared by the Cooperative Research Centre for Australian Weed Management provides useful guidelines for the appropriate use of herbicides to control weeds near waterways.</p> <p>Pesticide waste and disposal of drums can be undertaken through the drumMUSTER and ChemClear programs.</p>
<p>Maintaining soil productive capacity</p>	
<p>3.2.1.15 Minimise potential for soil erosion and mass movement by planning and using operational methods and restrictions appropriate to the soil erosion risk and slope.</p>	<p>Logging techniques specifically designed for steep slopes (such as cable logging) may be used to minimise soil movement.</p>
<p>3.2.1.16 Locate coupe infrastructure and roads to minimise soil erosion and degradation.</p>	
<p>3.2.1.17 Use appropriate equipment, techniques and operational management to minimise soil rutting, mixing and compaction.</p>	
<p>3.2.1.18 Limit the area of soil affected by coupe infrastructure to the minimum required to safely complete timber production to the required standard.</p>	
<p>3.2.1.19 Employ topsoil conservation techniques in areas affected by coupe infrastructure.</p>	
<p>3.2.1.20 Maintain effective drainage of coupe infrastructure and roads.</p>	
<p>3.2.1.21 Ensure chemical use is appropriate to the circumstances and takes into account the maintenance of soil productive capacity.</p>	

3.2.2 Conservation of biodiversity

Operational goals

Planning, harvesting, roading and silvicultural operations in private native forests specifically address the conservation of biodiversity, in accordance with relevant legislation and Regulations, and considering relevant scientific knowledge.

Harvested native forest is managed to ensure that the forest is regenerated and the biodiversity of the native forest is perpetuated.

The natural floristic composition and representative gene pools are maintained when regenerating native forests by using appropriate seed sources and mixes of dominant species.

The objective of habitat retention measures is to facilitate the continued occupation or recolonisation by all species that are likely to have occurred in the area, prior to timber harvesting. Thus, no part of the harvested area will become permanently unsuitable for any species likely to have been resident, or have been a regular visitor to the stand before it was harvested.

Opportunities to improve the protection of threatened species or habitat values may include reserving further strategic areas from harvesting, or modifying harvesting and silvicultural techniques to achieve specific conservation objectives.

Where vegetation is retained, consideration should be given to both the protection of retained vegetation during harvesting and subsequent management, and the effect of retained vegetation on the growth of future crop trees.

Streamside buffers may both protect water quality and act as a wildlife corridor.

However, the need for corridors along or across other topographic features will arise and should be considered in relation to the forest type and fauna present.

The following approaches should be considered to facilitate protection of biodiversity values:

- application of protection measures specified in relevant *Flora and Fauna Guarantee Act 1988* **action statements**, as applicable to private land
- use of wildlife corridors, comprised of appropriate widths of retained forest, to facilitate fauna movement between patches of forest of varying ages and stages of development
- retention of habitat trees or patches and long-lived understorey elements in appropriate numbers and configurations, and provision for replacement of old hollow-bearing trees within or around coupes; consideration should be given to both the protection of habitat trees during harvesting and subsequent management, and to the effect of retained trees on the growth of future crop trees
- providing appropriate undisturbed buffer areas around identified significant habitats
- modifying coupe size and dispersal in the landscape, and rotation periods, where possible and as appropriate

Local governments, and DEPI, may provide further information to assist private land managers to conserve biodiversity during the development of Timber Harvesting Plans.

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
Mandatory actions		
Addressing biodiversity conservation risks		
3.2.2.1	Where fire is used in timber production, all practicable measures must be taken to protect all areas excluded from harvesting from the impacts of unplanned fire.	
3.2.2.2	Rainforest communities in Victoria must not be harvested. Rainforest communities must be protected from the impacts of harvesting through the use of appropriate buffers to maintain microclimatic conditions and protect from disease and other disturbance.	<p>Action statement 238 under the <i>Flora and Fauna Guarantee Act 1988</i> only applies to rainforest communities listed in that statement.</p> <p>For rainforest communities not listed in action statement 238, the following rainforest identification and protection measures apply.</p> <p>Definition</p> <p>Rainforest is defined ecologically as closed (>70% projected foliage cover), broadleaved forest vegetation with a more-or-less continuous rainforest tree canopy of variable height, and with a characteristic composition of species and life forms.</p> <p>Rainforest includes closed transitional and seral communities, with emergent eucalypts, that are of similar botanical composition to mature rainforests in which eucalypts are absent.</p> <p>Rainforest canopy species</p> <p>Rainforest canopy species are defined as shade-tolerant tree species which are able to regenerate below an undisturbed canopy, or in small canopy gaps resulting from locally recurring minor disturbances, such as isolated windthrow or lightning strike, which are part of the rainforest ecosystem. Such species are not dependent on fire for their regeneration.</p> <p>In East Gippsland, warm temperate rainforest canopy species are:</p> <ul style="list-style-type: none"> • <i>Acmena smithii</i> (lilly pilly) • <i>Tristaniopsis laurina</i> (kanuka) • <i>Pittosporum undulatum</i> (sweet pittosporum) • <i>Acacia melanoxylon</i> (blackwood) • <i>Elaeocarpus reticulatus</i> (blue olive berry) • <i>Myrsine howittiana</i> (muttonwood) • <i>Cissus hypoglauca</i> (jungle grape). <p><i>Note: For the purposes of this definition jungle grape is defined as a canopy rainforest tree, provided that the vine is actually positioned within the tree canopy.</i></p> <p>In the Central Highlands and South Gippsland, cool temperate rainforest canopy species are:</p> <ul style="list-style-type: none"> • <i>Nothofagus cunninghamii</i> (myrtle beech) • <i>Atherosperma moschatum</i> (southern sassafras) • <i>Acacia melanoxylon</i> (blackwood) • <i>Pittosporum bicolor</i> (banyalla) • <i>Tasmannia lanceolata</i> (mountain pepper) • <i>Leptospermum grandifolium</i> (mountain tea-tree).

In South Gippsland, warm temperate rainforest canopy species are:

- *Pittosporum undulatum* (sweet pittosporum)
- *Myrsine howittiana* (muttonwood)
- *Acacia melanoxylon* (blackwood).

In the Otways, cool temperate rainforest canopy species are:

- *Nothofagus cunninghamii* (myrtle beech)
- *Acacia melanoxylon* (blackwood).

Excluded from the definition of rainforest

In all areas, forest stands that are dominated by single, non-diverse stands of the following species, and which contain few other rainforest characteristics, are not considered rainforest:

- *Acacia melanoxylon* (blackwood)
- *Leptospermum grandifolium* (mountain tea-tree)
- *Pittosporum undulatum* (sweet pittosporum)
- *Tasmannia xerophila* subsp. *robusta* (*Errinundra* pepper)
- *Tasmannia lanceolata* (mountain pepper).

Field recognition and delineation

Rainforest is recognised in the field as forest where the projected foliage cover of the broadleaved tree canopy is greater than 70%, and is contributed to by one or more of the canopy tree species listed above.

'Projected foliage cover' is the proportion of ground covered by the vertical projection of foliage and branches from canopy trees.

Linear stands are defined as stands of rainforest which are elongated and which are between 20 m and 40 m wide. Linear stands of rainforest usually occur along drainage lines or small streams. Linear stands may be overshadowed by eucalypts from the adjoining eucalypt forest.

The minimum area for recognition of a rainforest stand is 0.1 ha. The minimum narrowest width is 20 m (i.e. 20 m by 50 m).

Protection measures

Protect all rainforest from timber harvesting, as follows:

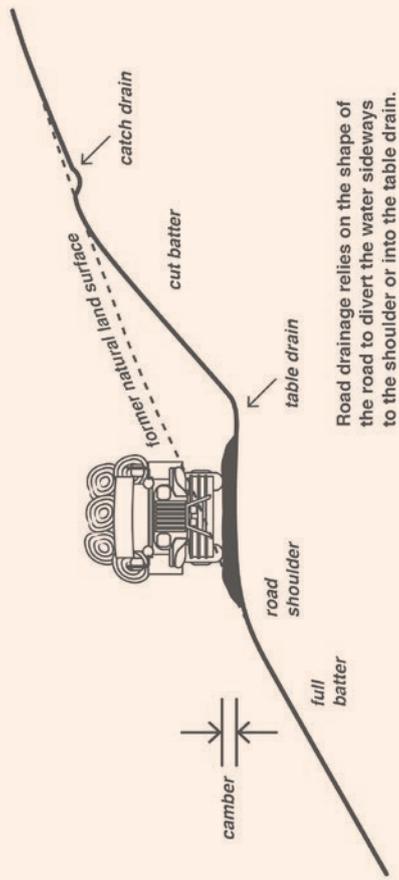
- Exclude non-linear stands that are 0.1 ha or more, but less than 0.4 ha, in size from timber harvesting. These stands do not require a buffer.
- Exclude linear stands that are at least 0.1 ha but are less than 0.2 ha from timber harvesting. These stands do not require a buffer.
- Exclude linear stands equal to or exceeding 0.2 ha from timber harvesting. Protect these stands with a 40m buffer.
- Exclude all rainforest stands (including linear stands) equal to or exceeding 0.4 ha from timber harvesting. Protect these stands with a 40 m buffer.
- Distribute slash away from retained rainforest stands or buffers.

Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
<p>Maintaining natural floristic composition and representative gene pools</p>	
3.2.2.3	Use silvicultural systems that suit the ecological requirements of the forest type.
3.2.2.4	Regenerate harvested areas using species and provenances native to the area.
<p>3.2.3 Forest Health</p>	
	<p>Maintaining forest health is important for ensuring the long-term ecological integrity and productivity of forests. Forest health can be promoted through stand management practices such as fire application, timber harvesting, including salvage felling and thinning and weed, pest and pathogen control. Some activities may require a permit from relevant planning authorities.</p>
	<p>Operational goals</p>
	<p>Forest health is monitored and maintained by employing appropriate preventative, protective and remedial measures.</p>
	<p>Chemicals are only used where appropriate to the site conditions and are conducted with due care for the maintenance of forest health, water quality, biodiversity and soil values.</p>
	<p>Mandatory actions</p>
3.2.3.1	<p>Implement appropriate vehicle and equipment hygiene precautions when moving from areas of known pest plant, pest animal and pathogen infestations.</p> <p>The risks posed by pest plants, pest animals and pathogens and other environmental stresses to forest health may be assessed regularly and systematically so that problems are detected early and appropriate remedial strategies are implemented. Pre-operations surveys can include soil sampling and testing for soil-borne pathogens as appropriate.</p> <p>Various aspects of forest health may be monitored and documented (aided by photographic records as appropriate) in assessments, including crown and foliage condition, presence of damaging agents and description of damage levels.</p> <p>Washing of machinery and equipment when moving between forest areas may assist in the control of the spread of some pathogens and weeds.</p> <p>Successful control or management of forest health problems may require coordinated action involving adjacent landholders and other forest owners.</p>

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)	Management guidelines
3.2.3.2	Implement appropriate control actions where timber harvesting operations have introduced or exacerbated a pathogen or weed.
3.2.3.3	Report the suspected introduction of new or unknown exotic agents to DEPI's Biosecurity section.
3.2.3.4	Where myrtle wilt fungus (<i>Chalara australis</i>), Cinnamon Fungus (<i>Phytophthora cinnamomi</i>) or Root Rot (<i>Armillaria</i>) is known to exist, apply appropriate measures to minimise the spread of these pathogens.
3.2.3.5	Ensure chemical use is appropriate to the circumstances and takes into account the maintenance of biodiversity.
<h3>3.3 Rooding for timber harvesting operations</h3>	
	This section covers the planning, design, construction, maintenance and use of permanent and temporary roads for haulage and machinery transport. This section does not consider requirements for snigging and forwarding tracks, which are covered under coupe infrastructure (section 3.4.2).
	Timber production roads have the potential to create significant environmental impacts, particularly on water quality and river health. The aim of this code of practice is to protect a range of environmental values while allowing economic rooding for timber harvesting operations, management purposes and other uses.
<h4>Operational goal</h4>	
	The planning and management of permanent and temporary roads for timber haulage and machinery transport ensures that the roads are fit for intended purpose, and protect environmental and cultural values and the safety of road users.
<h3>3.3.1 Road planning</h3>	
<h4>Mandatory actions</h4>	
3.3.1.1	Road planning and design for new and substantially upgraded roads within the property must ensure the road is adequate for the intended use, while ensuring the protection of water quality and conservation values, including river health.
3.3.1.2	Road planning must: <ul style="list-style-type: none"> i. locate roads to minimise risks to environmental values, particularly soil, water quality and river health, during both construction and ongoing road use ii. time construction activities to minimise risks associated with unsuitable weather conditions.

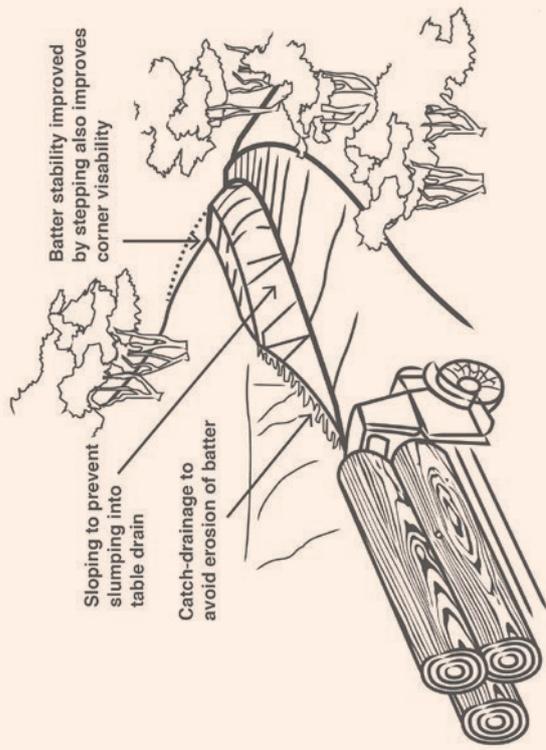
Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)	Management guidelines
<p>3.3.1.3 Existing roads must, where practicable, be used for access to a coupe or work site and to haul timber, except where it can be clearly demonstrated that a new or relocated road minimises or removes existing threats to soil, water quality or biodiversity.</p>	
<p>3.3.1.4 Plans for roads must be based on field surveys to ensure all environmentally sensitive locations are identified and appropriate design and construction techniques adopted.</p>	
<p>3.3.2 Road design</p> <p>Good road design is vital to minimise construction and maintenance costs, reduce environmental risk such as impacts to water quality, improve efficiency of haulage, and ensure public safety is maintained. It is important when designing a new road or improvements to an existing road that water is moved off the road into undisturbed vegetation to reduce the velocity (and hence erosivity) of water, and to provide the greatest possible infiltration of water into soil to trap sediments before discharge into waterways.</p> <p>Road design includes the consideration of road location, aspect, shape, traffic frequency, type and volume, slope, topography, surface materials, as well as road infrastructure including culverts, drains, batters, bridges and fords.</p>	<p>Bridges should be designed in accordance with AS 5100 – 2004 <i>Australian Bridge Design Code</i>.</p>
<p>Mandatory actions</p> <p>3.3.2.1 New or upgraded roads must be designed to a standard capable of carrying anticipated traffic with reasonable safety, and ensuring the protection of water quality and river health, and biodiversity conservation values.</p>	<p>Important considerations in road design are the season of harvesting, transport needs, construction standards specified in the planning scheme (or a permit issued under the planning scheme) and the water quality values to be protected.</p> <p>Road design should seek to increase the frequency of road drainage in areas where the risk of soil entering waterways is high.</p> <p>Roads may be designed and managed in accordance with:</p> <ul style="list-style-type: none"> • <i>Road classifications, geometric designs and maintenance standards for low volume roads</i> (Giumarra 2001) • <i>Unsealed roads manual: Guidelines to good practice</i> (ARRB 2000). <p>Bridges should be designed in accordance with AS 5100 – 2004 <i>Australian Bridge Design Code</i>.</p> <p>On steep slopes (greater than 20 degrees), engineering advice will assist in minimising the risk of road failure.</p>

Road drainage design: Example of good industry practice



Road drainage relies on the shape of the road to divert the water sideways to the shoulder or into the table drain.

Road drainage design: Example of good industry practice



Management guidelines	
<p>Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)</p>	
<p>3.3.2.2 All fill disposal areas and embankments must be planned and designed to minimise soil erosion, mass soil movement, and potential water quality deterioration.</p>	
<p>3.3.2.3 Stream crossings must be designed according to traffic requirements and the nature, size and period of flow (both pre and anticipated post-harvest) and characteristics of the bed and banks of the stream.</p>	<p>Where possible, stream crossings should be adequately elevated and low approaches maintained, so that water drains away from the crossing point and is discharged into vegetated areas, rather than flowing directly down the crossing to the stream channel.</p> <p>Placing gravel surfacing with a low sediment-generating potential on the road area on bridge approaches (within 20 m), and on unsurfaced bridges or culverts, will assist in reducing impacts on water quality. Where there are extended steep approaches to waterways, extending the length of gravel surfacing may be required.</p> <p>Placing adequate drainage structures approximately 20 m from waterways will allow discharge onto undisturbed vegetation and maximise the flow distance between the drainage outlet and the waterway.</p>
<p>3.3.2.4 Appropriate drainage must be provided. Spacing of drainage outlets along a road must take into account of the soil erodibility, the rainfall erosivity, and the proximity of the road to streams.</p>	
<p>3.3.2.5 Energy dissipating structures or silt traps must be used where necessary to reduce water velocity and trap sediments.</p>	<p>To avoid turbid water discharge into waterways, energy dissipating structures, silt traps or other protective measures may also be put in place to discharge into undisturbed vegetation.</p> <p>Culvert installation: Example of good industry practice</p> 

Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
3.3.2.6 Drainage onto exposed erodible soil or over fill slopes must be avoided where possible. Structures and earthworks required to avoid such discharges are to be identified during planning and construction as required.	
3.3.3 Road construction	
Mandatory actions	
3.3.3.1 Road construction must be conducted in a manner consistent with plans and designs.	Permanent road and temporary road construction should be conducted when rainfall and soil conditions minimise the risk of erosion and the potential off-site impact on water quality.
3.3.3.2 All fill disposal areas must be stabilised and rehabilitated when no longer required. Where revegetation is used to stabilise fills or embankments, the species must be suitable for the site and task, and where possible indigenous to the area.	Stabilisation may be achieved by measures such as, but not limited to, revegetation and use of erosion control materials. Additional information can be found in <i>Unsealed roads manual: Guidelines to good practice (ARRB 2009)</i> .
3.3.3.3 Erosion and sediment control must be an ongoing activity over the duration of the construction activity, integrated with the works schedule. Road construction sites must not be left unprotected between construction activities, as this constitutes an unacceptable water pollution risk.	Erosion from road construction sites is often dominated by coarse sediments. The use of sediment traps and ponds, followed by discharge into a vegetated area, may provide appropriate water treatment.
3.3.3.4 Quarry materials known to be infected with any pest plant or pathogen must not be used.	
3.3.3.5 Road construction must ensure that: <ul style="list-style-type: none"> i. disturbance to stream beds and banks is kept to a minimum ii. soil and rock fill is not pushed into streams, nor placed into a position where there is a risk that it can erode into a stream iii. cement, raw concrete, soil fill and other road making materials are not split into watercourses during any construction. 	
3.3.4 Road maintenance	
Mandatory actions	
3.3.4.1 Roads used for timber haulage must be maintained to minimise erosion and protect water quality and other environmental values.	
3.3.4.2 Road drainage systems must be maintained to minimise erosion and the discharge of sediment into waterways.	
3.3.4.3 Blading-off of roads is only permitted where measures are in place to prevent potential adverse impacts on water quality and where effective side drainage can be maintained.	

Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
3.3.5 Suspension of haulage	
Mandatory actions	
3.3.5.1 Heavy vehicle traffic must not use roads in private native forests when persistent wet weather or road stability compromise road drainage and water quality.	
3.3.5.2 Heavy vehicle traffic must not use roads in private native forests when persistent dry weather causes the surface materials to unravel to a degree that poses a threat to water quality, in the absence of suitable preventive or remedial actions to manage the risk to water quality.	
3.3.6 Road closure	
Mandatory action	
3.3.6.1 Roads no longer required for timber production or other management purposes, must be permanently closed and effectively drained.	Stabilisation of closed roads can be achieved by measures such as, but not limited to, revegetation and the use of erosion control materials. Section 3.5.1 of the code covers appropriate rehabilitation activities.
3.4 Timber harvesting	
3.4.1 Timber harvesting operations	
Operational goal	
Timber harvesting is conducted in a manner appropriate to the site, to manage the impact on soil, water and other values, including biodiversity and cultural heritage. During or following wet weather conditions, timber production operations are modified or where necessary suspended to minimise risks to soil and water quality values.	Notification of adjoining landholders that may be affected by timber harvesting operations may assist in the early resolution of any disputes. Consideration should be given to the Environment Protection Authority's <i>Interim guidelines for control of noise from industry in country Victoria</i> .
Mandatory actions	
3.4.1.1 All timber harvesting, including thinning, must be consistent with the Timber Harvesting Plan.	
Coupe boundaries	
3.4.1.2 The location of coupe boundaries, buffers, exclusion areas and areas where special management applies must be easily distinguishable in the field.	
3.4.1.3 Timber harvesting must only occur within the designated boundaries of the coupe as indicated on the Timber Harvesting Plan and where required, marked in the field, unless the operation is specifically exempted in accordance with this code.	

Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
3.4.1.4	<p>Timber must be directed to fall within the coupe boundary unless unsafe to do so. A decision to fall outside the coupe boundary must be documented on the Timber Harvesting Plan.</p>
	<p>Timber harvesting within buffers</p>
3.4.1.5	<p>Timber harvesting operations are not permitted in buffers or exclusion areas (identified on the Timber Harvesting Plan), except where the limited removal of the minimum number of trees is necessary for:</p> <ul style="list-style-type: none"> i. the protection of worker safety; or ii. the construction of roads or stream crossings. <p>Removal of trees from these areas must be noted on the Timber Harvesting Plan.</p>
3.4.1.6	<p>Buffers must be protected from damage caused by trees felled in adjacent areas. Trees accidentally felled into buffers may be removed if significant damage and disturbance of soil and vegetation in the buffer can be avoided.</p>
3.4.1.7	<p>Machinery must not enter a buffer area except for the construction and use of stream crossings specified in the Timber Harvesting Plan.</p>
3.4.1.8	<p>Pushing of fill or harvesting debris into a buffer or construction of drain structures within a buffer is not permitted except for construction of an approved stream crossing.</p>
	<p>Timber harvesting within filter strips</p>
3.4.1.9	<p>Trees may be felled from within filter strips. The felling of trees into filter strips must be avoided where possible.</p>
3.4.1.10	<p>Disturbance to soil and understorey vegetation from harvesting operations in filter strips must be minimised.</p>
3.4.1.11	<p>Machinery must not enter a filter strip except for the construction and use of stream crossings specified in the Timber Harvesting Plan.</p>
3.4.1.12	<p>Pushing of fill or harvesting debris into a filter strip is not permitted except for construction of an approved stream crossing.</p>
	<p>Timber harvesting on steep slopes</p>
3.4.1.13	<p>Timber harvesting operations must not occur on slopes where the operation cannot be conducted safely, threatens the stability of the soil or has high potential for adverse off-site effects. The potential for mass soil movement must be assessed and necessary preventive actions undertaken.</p>

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)	Management guidelines
3.4.1.14 On slopes with a high soil erosion hazard or where there is an assessed risk of mass soil movement, additional measures must be taken to avoid movement of soil into streams, such as modification to harvesting methods or increasing of the widths of buffers and filter strips.	
3.4.1.15 Logging techniques specifically designed for steep slopes (such as cable logging) may be used on all steep slopes (exceeding 30 degrees) where the area is assessed as being capable of supporting harvesting activities without risk of soil movement.	
3.4.1.16 On slopes with a high soil erosion hazard or where there is an assessed risk of mass soil movement, additional measures must be taken to avoid movement of soil into streams, such as modification to harvesting methods or increasing of the widths of buffers and filter strips.	
3.4.2 Coupe infrastructure Coupe infrastructure includes log landings and dumps, snigging and forwarding tracks used as part of the timber harvesting operation.	
Mandatory actions	
3.4.2.1 Log landings and dumps must not be located within areas excluded from harvesting.	
3.4.2.2 Coupe infrastructure must be rehabilitated on completion of timber production, where not required for future timber production, using rehabilitation techniques that provide suitable soil conditions for the regeneration and growth of vegetation existing on the site prior to harvesting. Refer to section 3.5 of this code.	Rehabilitating coupe infrastructure at the earliest possible opportunity, including while other parts of the coupe may be operational, will reduce risks to water quality.
3.4.2.3 Snigging and forwarding tracks must be placed at the greatest practicable distance from buffers and filter strips, without compromising operator safety.	
3.4.2.4 Tracks must have effective drainage to prevent soil erosion. Cross drains, where used, must be spaced and angled according to any prescriptions in planning schemes, conditions of any planning permit or other approved plan to prevent surface run-off and subsequent discharge of turbid water into streams or drainage lines.	Alignment of snigging tracks and forwarding tracks should be located where they can be effectively cross-drained and out-sloped. Appropriate drainage of snig tracks may include out-sloping, cross-draining or placement of a slash to interrupt the surface water flow and disperse it onto undisturbed or uncompacted areas. Cross drains should be spaced and angled according to local prescriptions (where these exist), according to the soil erosion hazard class.
	Tracks designed with minimal slope and cross fall will assist drainage. Preference should be given to uphill snigging using spurs and ridge tops, where possible.

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)	Management guidelines
3.4.2.5	Snigging and forwarding tracks must not be bladed off where this would result in an adverse impact on water quality or the loss of topsoil from the site.
3.4.2.6	Rehabilitation of coupe infrastructure must be assessed within three years of initial treatment and, where found inadequate, remedial action must be taken.
3.4.3 Operational restrictions	
Operational goal	
During or following wet weather conditions, timber production is modified or where necessary suspended to minimise risks to soil and water quality values.	
Mandatory actions	
3.4.3.1	Snigging and forwarding operations must be suspended when significant rutting is likely to be caused by machine traffic unless actions are taken to reduce that risk.
3.4.3.2	Snigging and forwarding operations must be suspended when water begins to flow along tracks, threatening stream water quality or soil values, unless appropriate remedial actions have been taken to protect those values.
3.4.3.3	Timber production on landings must be suspended when continuation would result in significant deterioration of the landing surface causing increased levels of compaction or mixing of bark through soil on the landing surface.
3.5 Forest regeneration and management	
This section covers the regeneration of private native forest and the subsequent management of such stands, where required. Unless required for another approved purpose, private native forests in Victoria are to be successfully regenerated to approximate the original forest composition.	
3.5.1 Regeneration	
Regeneration of private native forests must be in accordance with <i>Permitted clearing of native vegetation – Biodiversity assessment guidelines (2013)</i> an incorporated document in the VPPs and all planning schemes.	

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
<p>Operational goals</p> <p>Harvested native forest is managed to ensure that the forest is regenerated and that the biodiversity of the native forest is perpetuated.</p> <p>The natural floristic composition and representative gene pools are maintained when regenerating native forests by using appropriate seed sources and mixes of dominant species.</p>		<p>A receptive seedbed for regeneration may be achieved by burning harvest debris, or by mechanical disturbance (either as part of timber harvesting operations, or following operations).</p> <p>Burning of debris may reduce the fire hazard associated with large accumulations of flammable materials and promote the regeneration of fire-dependent species. However, it may also affect the regeneration of fire-sensitive species. Mechanical disturbance may have impacts on soil or water-quality values, and on the regeneration of some species.</p>
<p>Mandatory actions</p> <p>3.5.1.1 Action must be taken to secure the regeneration of harvested coupes, except where:</p> <ul style="list-style-type: none"> i. the land is to be used for an approved purpose for which native vegetation is not compatible (for example, approved services and infrastructure, and structures); or ii. timber has been harvested by thinning a stand; or iii. the stocking of seedlings or regrowth is assessed as sufficient through natural regeneration processes. <p>3.5.1.2 Silvicultural methods for regeneration must suit the ecological requirements of the forest type and local conditions.</p>		<p>The regeneration of understorey species should be facilitated where possible.</p> <p>Harvesting and regeneration methods that provide appropriate disturbance to understorey elements to ensure their ongoing survival or protect understorey patches may assist in regenerating this component of the forest structure.</p> <p>DEPI maintains guidelines and standards against which regeneration may be assessed, that may provide a useful reference for forest managers and operators.</p> <p>Where natural seedfall or artificial sowing is used, surveys may be conducted to assess the quality of the seedbed before seed is applied.</p>
<p>3.5.1.3 Where fire is used in regeneration operations, all practicable measures must be taken to protect all areas excluded from harvesting (including buffers and filter strips).</p>		
<p>3.5.1.4 Private native forest must be regenerated following timber harvesting operations, with species native to the area, wherever possible using the same provenances, or if not available, from an ecologically similar locality. An ecologically similar locality for a species is from a similar elevation, aspect, soil type and/or climate, preferably as close as possible to the harvested area.</p>		
<p>3.5.1.5 Except where past management practices may have altered species composition, regeneration operations must aim to approximate the composition and spatial distribution of canopy species common to the coupe prior to harvesting, where they can be determined.</p>		

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)	Management guidelines
3.5.1.6 Where mechanical disturbance is used, it must be undertaken with due consideration of erosion risk potential and the proximity of waterways (refer to section 3.2).	
3.5.2 Stocking assessment and remedial treatment	
Operational goal	
Stocking and early seedling growth is monitored and remedial action is taken where necessary to successfully regenerate harvested areas of native forests.	Where selection (uneven-aged) silvicultural systems are used, stocking assessments should take account of retained trees and their impact on the health and vigour of regrowth.
Mandatory actions	
3.5.2.1 Stocking on harvested coupes must be assessed within three years of treatment, to determine whether regeneration has been successfully achieved and to ensure that re-treatment occurs where necessary.	
3.5.2.2 Where stocking, health or early growth is inadequate, remedial work must be conducted as soon as practicable to obtain adequate regeneration. Further assessment must be undertaken following remedial treatment.	
3.5.2.3 The results of assessment must be recorded for future reference.	The results of assessments and details of any further silvicultural treatments may be recorded on Timber Harvesting Plans.
3.5.3 Tending	
Tending includes stand improvement (such as overwood removal or reduction), timber harvesting operations including thinning, fertilising and other silvicultural practices to promote stand health and timber production. Appropriate action may be taken to tend native forest stands where consistent with environmental safeguards and off-site impacts are minimised.	
Operational goal	
The productive capacity and other values of the forest are maintained or enhanced by appropriate tending of stands.	
Mandatory action	
3.5.3.1 Tending operations must be planned and conducted in a manner that minimises adverse impacts on areas that are excluded from harvesting.	DEPI has publicly available standards for undertaking commercial thinning in various forest types, which private forestry operators may wish to adopt.

4. Management guidelines - plantations

Code clauses <i>(Explanatory statements, operational goals or mandatory actions)</i>	Management guidelines
<p>Plantations are managed stands of trees of either native or exotic species, planted or sown primarily for timber production purposes. This Chapter applies to timber production in all plantations, except those managed by the Department of Environment and Primary Industries (which are subject to Chapter Two).</p> <p>Plantation development is regulated by the Victoria Planning Provisions (VPP) and a permit is generally not required. Refer to your local planning scheme for details. The code is an incorporated document in the VPP.</p>	
<h3>4.1 Plantation planning and design</h3>	
<h4>4.1.1 Plantation planning and design</h4>	
<p>Operational goals</p>	
<p>Plantations on private land are designed, managed and operated in accordance with this code.</p>	
<p>Local government is appropriately informed of new plantation development on private land by the lodgement of either a Plantation Development Notice or a planning permit, in accordance with this code.</p>	<p>Local government planning scheme provisions applying to the land on which a new plantation development is proposed determine whether or not a planning permit is required.</p> <p>Where a permit is required, the plantation proponent needs to submit a planning permit application for consideration by the responsible LGA.</p> <p>Where a planning permit is not required, the code requires that a Plantation Development Notice is lodged with the LGA. The Plantation Development Notice simply notifies the LGA that a new plantation is being developed, whereas a planning permit application, if required, seeks consent to develop land as a plantation.</p> <p>A Plantation Development Notice alerts the LGA of the imminent establishment of a plantation for which it has code monitoring responsibilities under the planning scheme. It also allows the LGA to consider in advance the implications for road infrastructure that may arise from cartage associated with subsequent harvesting of the plantation. A Plantation Development Notice is not intended as a comprehensive planning or design instrument, nor does it require approval or endorsement from the LGA before plantation development proceeds. Thus, while lodgement of a Plantation Development Notice is a requirement of the code, it cannot be expected to comprehensively demonstrate that intended plantation establishment (or subsequent) practices comply with all the applicable provisions of the code.</p>

Mandatory actions

4.1.1.1 Plantation design must take account of environmental values, and be consistent with relevant fire protection requirements.

This action is primarily directed at new (first rotation) plantations. The options for design of subsequent plantation rotations on the same site may be constrained by residual aspects of previous plantation design. However, within any such constraints, consideration of plantation design for subsequent rotations should consider environmental values, and be consistent with relevant fire protection requirements, but is not a mandatory action.

Plantations may be established with any species that meet the objectives of the grower, unless the growing of that species is prohibited by the provisions of any laws or regulations.

'Fire protection requirements' means statutory or obligatory requirements rather than recommendations or guidelines. The Country Fire Authority (CFA) has resources available which provide guidance to property owners with respect to fire management.

Where applicable, consideration should be given to maintaining access for utility operation and maintenance vehicles to power line assets within a plantation. The plantation owner's responsibility in this regard is limited to not preventing access for utility operation and easement maintenance through plantation planning and design. It is the power line authority's responsibility to provide and maintain the necessary access infrastructure. Plantation planning should also consider providing appropriate setbacks from power lines, to minimise the risk of falling trees coming in contact with power lines. Advice regarding appropriate clearances and access may be sought from the relevant distribution authority at the design phase.

4.1.1.2 For new plantations where a planning permit is not required, a Plantation Development Notice must be lodged with the local government not less than 28 days prior to the commencement of site preparation. The 28 day minimum lodgement time may be waived with the agreement of the local government.

'New plantation' is defined in the code's glossary as a 'plantation development where the previous land use was not plantation.'

Thus lodgement of a Plantation Development Notice is only required when a plantation is being established for the first time (first rotation) and where a planning permit is not required. A Plantation Development Notice is not required for the re-establishment of subsequent rotations on the same land, even if there is a change of species, silvicultural regime or minor boundary changes. However, plantation owners may choose to lodge a Plantation Development Notice for subsequent rotations, for example to document that plantation trees have been established with the objective of managing them for timber harvesting purposes.

The responsibility for lodgement of a Plantation Development Notice rests with the plantation owner, but lodgement may be undertaken by a manager or other party acting on behalf of the owner. The LGA is encouraged to acknowledge receipt of lodgement of a Plantation Development Notice.

'Site preparation' is defined in the code's glossary. In respect of the 28-day minimum notice period of this action, commencement of site preparation is regarded as occurring when activities begin that specifically relate to preparation of the ground to provide conditions suitable for seedling establishment (such as formation of planting rows or spots by mechanical **soil disturbance**, broad-acre weed control or pre-plant strip or spot weed control). Therefore, it does not include activities such as site survey, site clean-up (including fence or debris removal), pest animal control, or any **road construction** or improvement.

Most plantations should not require a permit application. Instances where planning schemes may require a planning permit for plantation establishment include when:

- timber production is not specified as a section 1 (permit not required) use in the table of uses for the zone applying to the land concerned
- the proposed plantation does not meet the conditions specified for timber production in section 1 of the table of uses for the applicable zone
- a permit is required under the provisions of an overlay applying to the land concerned
- a permit is required under the provisions of clause 52.17.

The LGA should be consulted to establish whether any such instances apply.

4.1.1.3 A Plantation Development Notice must include:

- i. the landowners name and address
- ii. the total area to be planted
- iii. species to be planted
- iv. year of planting
- v. a map of the plantation, showing:
 - the location of the plantation
 - any access roads or tracks
 - power lines
 - any retained native vegetation within the plantation boundaries.

A Plantation Development Notice template is provided in Appendix 3 to assist plantation owners lodge a Plantation Development Notice in accordance with the code. Use of this template is encouraged but is not mandatory. Plantation owners are entitled to prepare and lodge a Plantation Development Notice in any format that meets the Plantation Development Notice requirements stipulated in the code.

4.2 Environmental values in plantations

Environmental values such as biodiversity, carbon sequestration, salinity control and water quality in plantations must be considered at all stages, from planning through to harvesting and re-establishment. Adverse impacts from plantations on environmental values, particularly water quality and river health, can be minimised by appropriate planning and management.

4.2.1 Water quality, river health and soil protection

Waterways include all permanent and temporary streams, pools, wetlands and drainage lines. Well managed plantation establishment, tending, roading and harvesting operations near waterways may avoid unacceptable off-site impacts.

Water quality degradation

Water quality degradation in rural environments is caused by a range of factors including:

- transportation of soil sediments, especially from eroding stream banks
- the entry of excessive nutrients or nutrient enrichment
- chemical contamination from the use of herbicides and pesticides
- changes to the flow rates of rivers
- seepage of contaminated groundwater into surface water bodies
- contamination by biological material and pathogens.

These factors appear as pollutants in aquatic ecosystems in the form of:

- suspended solids (as indicated by turbidity)
- eutrophication, which can lead to the growth of unwanted aquatic plants (including algal blooms)
- contamination of the aquatic chemistry
- increased salinity.

Impact of suspended sediments

Suspended sediments from soil erosion and already deposited stream and river sediments create turbidity (cloudiness) in water bodies with undesirable effects including:

- reduced service life expectancy of water storage facilities (such as weirs and reservoirs)
- increased cost of water treatment for human consumption
- degraded aesthetic and recreational values of water bodies
- increased nutrient loads
- reduced light penetration (causing adverse impacts on aquatic ecology)
- smothered aquatic ecosystems.

While some river systems are naturally turbid, the excessive delivery of suspended solids into streams contributes to river degradation.

Principles of water quality protection in forested catchments

The greatest environmental hazard associated with timber harvesting is its potential to affect water quality. The whole of the landscape is a water catchment, so all plantation forests are located in water catchments. A specific catchment is defined as a natural geographical area which feeds into a common water drainage system. It may also refer to a natural planning unit for the management of natural resources. Water degradation in forested catchments can be minimised by the following actions.

- *Limiting and controlling run-off:* soils in forested areas are generally permeable: that is, rainfall tends to infiltrate the profile, rather than to run over its surface. However, some aspects of harvesting can increase surface run-off. For example, most surface water in plantations comes from compacted surfaces (such as tracks and unsealed roads). The movement of machinery may cause compaction of the soil along extraction tracks, and on log storage areas and landings. Soil compaction will occur especially if operations are conducted during wet conditions. It reduces the infiltration capacity of the soil and increases the propensity for surface flow, which can transport sediments into waterways. Avoiding soil compaction is a key consideration when planning and conducting plantation harvesting, if the potential for uncontrolled run-off is to be minimised.
- *Limiting soil erosion:* erosion occurs naturally as part of the soil weathering process. However, activities such as vegetation clearance and road and track construction can lead to enhanced soil erosion, by increasing its exposure to rain drop impact and by encouraging uncontrolled surface run-off from roads and tracks. Erosion is enhanced by compacted soils, particularly on sites with erodible subsoils.
- *Rigid implementation of best management practices:* research has shown that where best management practices (such as retention of appropriate waterway buffers, minimal **soil disturbance** close to waterways and appropriate drainage control measures on roads and extraction tracks) are rigidly adhered to, the impacts of plantation harvesting on water quality can be minimal.

Benefits of retaining vegetation adjacent to waterways

Vegetated areas adjacent to waterways act to:

- reduce the flow of sediment and associated pollutants from key source areas (such as tracks and roads) before they reach the waterway
- reduce the movement of soluble pollutants and chemicals from the hill slope to the waterway
- maintain stable waterway channels, and protect and enhance ecological values.

How does it work?

The roughness of the vegetated area, largely determined by the density of vegetation and obstacles such as logs, fallen debris and leaf litter, acts to slow surface water flow and then to filter it and induce the deposition of any sediment pollutants.

Vegetated areas tend to maintain soils with high hydraulic conductivity which allows surface water to drain quickly through their profile, instead of running off the surface. This reduces overland flow and the delivery of any associated pollutants to streams. The presence of larger overstorey vegetation also reduces the potential for water-borne pollutants to reach streams via subsurface water movement.

The provision of shade and the accession of woody debris and nutrient inputs also help to maintain terrestrial and aquatic ecological values.

Consequently, waterways are threatened when plantation harvesting or site establishment operations result in:

- a loss of surface roughness and a corresponding increase in channelised pathways for down-slope water flow
- a reduction of soil hydraulic conductivity, due to compaction from machinery traffic
- increasing stream water temperature, through destruction of streamside vegetation
- a reduction in carbon and nutrient inputs for habitat function.

Operational goals

Water quality and river health values are maintained or improved in plantations by protecting waterways from disturbance.

Soil erosion and water pollution are minimised by avoiding plantation operations in inappropriate areas or slopes and undertaking necessary preventive measures.

Water quality and river health may be protected by establishing or maintaining a zone of indigenous native vegetation along the riparian land. The retention of existing native vegetation and re-establishment of indigenous native vegetation along waterways is encouraged. The protection and restoration of the riparian zone is important to assist in the maintenance of healthy rivers and landscapes and the protection of social and cultural values.

The benchmark from which 'maintained' or 'improved' is assessed is the state that existed prior to the commencement of plantation establishment or harvesting operations.

In the context of the operational goal, 'disturbance' means changes to the characteristics of a waterway, riparian vegetation or the linkages between a waterway and the catchment, which are of sufficient extent and duration to risk a material deterioration of water quality or other river health values.

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
Mandatory actions		
Waterways		
4.2.1.1	The entry of soil and other pollutants into waterways must be avoided as far as is practicable.	<p>Pollutants can include nutrients, chemicals and contamination by biological materials and pathogens. 'Waterway' is defined in the code's glossary.</p> <p>There are appropriate Australian standards (such as AS1940) for the storage and handling of fuels that should be considered, to minimise the risk of pollutants entering waterways.</p> <p>Waste oil, all empty drums, discarded machinery parts and other waste must be removed from the forest. There may be suitable disposal facilities for these types of waste.</p> <p>The storage, use and disposal of petroleum products and machinery servicing must not pollute the environment, nor result in littering.</p> <p>Toilet waste must not be allowed to enter a waterway.</p>
4.2.1.2	Timber production (including establishment, tending, roading, harvesting and re-establishment) must be planned and conducted in such a manner as to minimise mass movement or sedimentation of waterways.	Refer to the definitions for the meaning of ' mass movement '.
4.2.1.3	Machinery activity within 20 metres of any waterway must be kept to the minimum necessary, to avoid soil disturbance.	<p>Any unavoidable machinery activity near a waterway should:</p> <ul style="list-style-type: none"> • be parallel to the waterway wherever practicable • done in such a way as to ensure water is not diverted from any waterways • not take place when the soil is saturated. <p>The objective is to minimise the potential for directing or concentrating the overland flow into a waterway via any channelisation, compacted path or soil disturbance arising from machinery activity near waterways.</p> <p>'Machinery activity' has two aspects:</p> <ul style="list-style-type: none"> • the positioning of the machine itself and thus the footprint (visible or not) of the machine's tracks or wheels • the operation of any attachments fitted to the machine (such as a blade, stick rake, bucket, ripper tine, plough or mounding discs, grapple or felling/harvesting head). <p>The provision of buffer strips and filter strips on waterways running through or adjacent to plantations is not mandated in the code. The focus is on protection of water quality through the minimisation of soil and debris entry into waterways. The key is conducting forest operations in a manner that minimises risks to water quality and river health.</p>

The mandatory action allows machinery activity within 20 m of a waterway, provided it is the minimum necessary and avoids **soil disturbance** such that the risk of sediment movement into waterways is minimised. 'Minimum necessary' means the least possible machinery activity consistent with achieving the objectives of the task at hand, following a reasonable consideration of viable alternatives.

The risk of soil movement into waterways increases with higher soil erodibility, lower soil permeability, lesser protective cover (litter, slash, vegetation), higher rainfall erosivity, steeper slopes, and increased soil disturbance (which can be influenced by the intensity and magnitude of machinery activity). This action recognises that the proximity and nature of machinery activity to waterways also influences the risk of waterway sedimentation. The risk and implications of waterway sedimentation also increase as stream order increases.

It follows that the extent and nature of machinery activity planned and undertaken within 20 m of waterways requires the application of site-specific judgement by experienced practitioners, based on field assessments and adoption of a risk management approach. The ultimate test of the adopted approach are the outcomes (in terms of minimising, as far as is practicable, the entry of soil and debris into waterways arising from machinery activities).

Site preparation by non-mechanical means near waterways may minimise erosion and the risk of sedimentation to water quality.

4.2.1.4 Machinery activity must not occur within five metres of the saturated zone of a permanent or temporary stream (except for the minimum necessary to construct stream crossings), or wetland.

'Machinery activity' is as indicated in 4.1.1.4, except that plantation trees may be harvested either mechanically or manually from within 5 m of the saturated zone of a permanent or temporary stream provided:

- any machine's tracks or wheels remain at least 5 m from the saturated zone
- a high level of care is taken when extracting trees, to not cause **disturbance** to the bed or bank of the stream.

'Saturated zone' is defined in the code's glossary (as Saturation zone).

Machinery can enter within 5 m of the saturated zone of a permanent or temporary stream when using a **designated crossing**.

4.2.1.5 Crossing of waterways with ground-based machinery must be avoided, except when constructing or using a designated crossing. Where temporary crossings or log culverts are used, they must be removed immediately after harvesting or any subsequent replanting work for which they are required, using a technique that minimises soil disturbance.

'Crossing of waterways' refers to traversing across a waterway from one side to the other.

Stream crossings must be designed to comply with the *Water Act 1989*. Works (including stream crossings) on designated waterways require a works on waterways permit from the relevant CMA.

A '**designated crossing**' may provide for the crossing of a permanent or temporary stream, drainage line, pool or wetland by a plantation road (see section 4.4 of the code) or a snigging and forwarding track (see section 4.5.3 of the code).

A '**designated crossing**' is where a crossing location has been specifically identified on a Timber Harvesting Plan, other operational plan or in the field, and is constructed or installed in a manner that allows for typical peak annual flows. It may be a permanent crossing, a **temporary crossing** or a crossing segment (drainage lines only – see below).

A '**permanent crossing**' would typically involve the construction of a bridge, culvert or ford designed to minimise impacts on water quality.

A '**temporary crossing**' is a crossing constructed or installed for a particular short-term phase of plantation operations, and is designed for removal following completion of the operations that the crossing was constructed/installed to service. There may be circumstances where the topography of the plantation operations area, soil type and conditions, drainage line profile and the nature of the plantation operation to be conducted are such that it is reasonable to delineate a linear segment of the upper reach of a drainage line as a **designated crossing**. This designation may then allow the limited passage of ground-based machinery across the delineated segment of the drainage line at a number of locations, where this can be achieved without compromising soil stability or water quality. Such an approach may be adopted to allow the passage of machinery associated with ripping or mounding (with implements lifted clear of the ground surface), or chopper rolling, or harvesting forwarders, that are generally working along the contour, to cross the upper reach of a drainage line with single or limited passes across any particular crossing point in the segment.

Where harvesting slash is placed in the bed of a drainage line to form a **temporary crossing** (typically to protect the bed and surrounds of a drainage line to allow crossing by harvesting forwarders) the slash may be left in situ if it does not obstruct or divert the flow of water or destabilise the waterway and removing it would risk causing more **soil disturbance** and impact to water quality than leaving it in place.

Management guidelines

Code clauses (Explanatory statements, operational goals or mandatory actions)

<p>4.2.1.6 Tree extraction must not cause disturbance to the bed or bank of permanent or temporary streams. Damage to associated riparian vegetation must be minimised.</p>	<p>While the code's glossary describes 'extraction' as 'removing produce from stump to log landing or storage area', for the purposes of this action it can also be taken to include tree felling.</p> <p>Minimising damage to riparian vegetation can be considered in the context of the practicality and implications of alternative approaches that may exist for tree extraction. For example, limited damage to vegetation resulting from cable harvesting across a temporary stream may be preferable to construction of an extra length of extraction road with stream crossings, if the latter represents the alternative to limited, recoverable vegetation damage from cable harvesting.</p> <p>Directing trees to fall away from a waterway will assist in minimising disturbance to the bed and banks of the waterway.</p> <p>Harvest debris should generally be kept out of waterways but can remain within the buffer, to protect soils. The removal of debris from a waterway may cause disturbance, and consideration should be given to the action that has the least impact on water quality.</p>
<p>4.2.1.7 Retained native vegetation along a waterway must be protected from damage caused by ground-based timber production. Trees accidentally felled into retained vegetation or across a waterway may only be removed with minimal disturbance to vegetation or soil.</p>	<p>This action applies to all phases of plantation operations from establishment (or re-establishment) to harvesting.</p> <p>'Retained native vegetation' means native vegetation that:</p> <ul style="list-style-type: none"> • must be retained under planning scheme provisions (including clause 52.17) or planning permit conditions • the plantation or land owner chooses to retain in addition to any statutory obligations. <p>'Protected from damage' means conducting ground-based plantation operations in a manner that minimises damage, taking into consideration the circumstances at the plantation site and the practicality and implications of viable options for conducting the operation concerned.</p> <p>It is recognised that linear patches of retained native vegetation along waterways may experience some wind damage, due to increased exposure following the harvesting of nearby plantation trees. This code provision does not refer to such subsequent damage, which often occurs well after harvesting has been completed.</p> <p>The provision applying to the removal of trees accidentally felled into retained (native) vegetation applies to both mechanical and manual harvesting operations.</p> <p>Directing trees to fall away from a waterway will assist in minimising disturbance to the bed and banks of the waterway.</p> <p>Harvest debris should generally be kept out of waterways, but can remain within the buffer to protect soils. The removal of debris from a waterway may cause disturbance, and consideration should be given to the action that has the least impact on water quality.</p>

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
4.2.1.8	<p>Additional measures to protect water quality and aquatic habitat, including increasing the zone of minimal machinery activity, must be adopted where there is a high local risk due to:</p> <ol style="list-style-type: none"> the erodibility of soils rainfall erosivity steep slopes particular riparian habitat values the intensity and magnitude of the harvesting operation any particular requirements of a water supply offtake point. 	<p>This action requires the application of a risk management approach (analysis and response). Refer to the risk assessment matrix in Appendix 2.</p> <p>Refer to Appendix 1 for a field guide to assist in the assessment of soil erodibility.</p> <p>Performance monitoring in respect of this action would take account of the quality of the risk analysis and the nature of the responses implemented in light of the operational goals of 4.1.1, and the specific attributes and circumstances applying to the plantation site concerned.</p> <p>Directing trees to fall away from a waterway will assist in minimising disturbance to the bed and banks of the waterway.</p> <p>Harvest debris should generally be kept out of waterways, but can remain within the buffer to protect soils. The removal of debris from a waterway may cause disturbance, and consideration should be given to the action that has the least impact on water quality.</p>
<p>Steep slopes</p>		
4.2.1.9	<p>Timber production (including establishment, tending, roading, harvesting and re-establishment) must be planned and conducted in such a manner as to not compromise soil stability or lead to mass movement or sedimentation of waterways.</p>	<p>Logging techniques specifically designed for steep slopes (such as cable logging) may assist in minimising soil movement.</p> <p>Minimising soil disturbance in steep country</p> <p>Example of good industry practice</p> <ul style="list-style-type: none"> The use of cable harvesting systems in plantations in steep country, to reduce environmental impacts by limiting on-site soil disturbance and minimising roading requirements, which could otherwise involve significant earthworks and disturbance to waterways. <p>Site preparation by non-mechanical means near waterways may minimise erosion and the risk of sedimentation to water quality.</p>
4.2.1.10	<p>Timber production must not occur on slopes where the operation cannot be conducted safely, or if it threatens the stability of the soil or has high potential for adverse off-site effects. The potential for mass soil movement must be assessed and necessary preventive actions applied.</p>	<p>For this action, 'safely' refers to occupational health and safety considerations. The Victorian Work Cover Authority's industry standard <i>Safety in Forestry Operations Harvesting and Haulage</i> describes the instability of machinery and the consequent risk of rollover as a common hazard in manual falling, mechanical harvesting and log extraction. Log extraction on steep ground is considered a high-risk forestry activity in the standard. The standard outlines a number of common hazards and risk control options for operations conducted on steep slopes. This action involves a risk management approach in respect of both occupational health and safety and soil stability/off-site effects.</p>
4.2.1.11	<p>Soil and water values must be protected by the limitation of site preparation and harvesting operations on steep slopes or on lesser slopes of unstable soil where erosion hazard is high.</p>	<p>'Erosion risk' and 'soil erodibility' are defined in the code's glossary.</p> <p>The use of the categories low, medium, high and very high for soil erosion hazard is taken to refer to the soil erosion classification approach used in the <i>Field Guide and Assessment Kit – Soil Erosion Hazard & Soil Permeability Assessment & Classification</i> (Centre for Forest Tree Technology, 1999).</p>

Code clauses (Explanatory statements, operational goals or mandatory actions)

Management guidelines

4.2.1.12 On slopes greater than 30 degrees with low or medium soil erosion hazard, and slopes less than 30 degrees with a high or very high soil erosion hazard, additional measures must be taken to avoid movement of soil into streams, such as the adoption of cable harvesting or the provision of appropriate buffers and filter strips.

This guide, included as Appendix 1, was developed to assist field practitioners involved with native forest timber harvesting and roading operations to classify the soil erosion hazard, the soil permeability and the potential for overland flow. Its applicability to plantations established on ex-pasture sites has not been thoroughly evaluated, although it is used by at least one major plantation company in Victoria.

The guide explains a methodology that combines assessments and ratings of soil susceptibility to breakdown and soil permeability to derive a soil erodibility classification, which is in turn combined with an assessment and rating of the soil erosion site factor to arrive at a soil erosion hazard classification (low, medium, high and very high).

This is one forest erosion hazard assessment system used in Australia and there may be other acceptable methods.

The adoption of additional measures needs to be appropriate to the operation and site. For areas of low or medium soil erosion hazard, it is reasonable to adopt additional measures in accordance with the proportion and distribution of any slopes exceeding 30 degrees within the plantation operations area.

The code does not prescribe buffer and filter strip widths for plantations. However, on sites described in the action, it may be appropriate to exclude or restrict harvesting adjacent to a waterway, as an additional measure to avoid the movement of soil into streams.

4.2.2 Conservation of biodiversity

Operational goal

Timber production planning and implementation in plantations address the conservation of biodiversity, including rainforest, in accordance with relevant laws.

Opportunities to improve the protection of threatened species or habitat values to achieve specific conservation objectives may include:

- application of protection measures specified in relevant **action statements** under the *Flora and Fauna Guarantee Act 1988*, where they apply to private land
- reserving strategic areas from harvesting
- modifying harvesting and silvicultural techniques.

DEPI may provide guidance and further information to assist private land managers in protecting biodiversity during the preparation of Plantation Development Notices or Timber Harvesting Plans.

Reference to measures for protecting biodiversity is not a mandatory element of a Plantation Development Notice lodged with the LGA (see section 4.1 of the code). Landowners establishing (or re-establishing) plantations may deem it appropriate to prepare for their own purposes more detailed plans for establishment operations, and may choose to incorporate advice and provisions relating to protecting biodiversity in such plans. Timber Harvesting Plans are required to include any measures to be undertaken for protection of biodiversity (refer section 4.5.1 of the code).

Selecting locally indigenous species for use in a plantation may assist in meeting regional conservation objectives.

Mandatory actions

4.2.2.1 **Retained native vegetation** must be protected from damage caused by timber production.

'Retained native vegetation' means native vegetation that:

- must be retained under planning scheme provisions (including clause 52.17) or planning permit conditions
- the plantation or land owner chooses to retain in addition to any statutory obligations.

'Protected from damage' refers to conducting plantation operations in a manner that minimises damage, taking into consideration the circumstances at the plantation site and the practicality and implications of viable options for conducting the operation concerned.

It is recognised that patches of retained native vegetation within or adjacent to a plantation may experience some wind damage, due to increased exposure following the harvesting of plantation trees. This code provision does not refer to such subsequent damage.

Note that two of the exemptions to clause 52.17 of planning schemes provide that no permit is required to remove, destroy or lop native vegetation to the minimum extent necessary if:

- the native vegetation has been planted or grown as a result of direct seeding for crop raising, which includes timber production (there is a qualification if public funding was provided to assist in planting or managing the native vegetation)
- the native vegetation is regrowth which has naturally established or regenerated on land lawfully cleared of naturally established vegetation and is within the boundary of a timber production plantation, as indicated on a Plantation Development Notice or other documented record, and has established after the plantation.

4.2.2.2 Any burning operations undertaken must be planned and managed to minimise damage to retained native vegetation both within and outside the operational area.

4.3 Establishment and management of plantations

Establishment activities for plantation development include site preparation, chemical usage and processes for maintaining forest health.

Management guidelines	
<p>Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)</p> <p>4.3.1 Site preparation</p> <p>Site preparation activities should be appropriate for successful tree establishment and growth, while minimising potential adverse environmental impacts.</p>	<p>Minimising disturbance during site preparation</p> <p>Examples of good industry practice</p> <ul style="list-style-type: none"> • As far as is practical, minimising the extent and degree of soil disturbance during plantation site establishment. • Conducting mechanical site establishment operations (such as ripping and mounding) along the contour minimises opportunities for channelised down-slope water flow, which can cause erosion. • Confining non-contour site establishment operations to situations where: <ul style="list-style-type: none"> - there are gentle slopes (less than 10%) and stable soils of low erodibility - there is sufficient scattering of logging slash and debris on second or subsequent rotation sites to minimise soil erosion by assisting the dispersal and on-site trapping of sediment in surface run-off - disturbance of soil can be minimised by limiting abrupt machinery turning.
<p>Operational goal</p> <p>Site preparation is appropriate to the characteristics of the particular site, and take into account the maintenance of soil and water values as well as site productivity.</p>	<p>When a plantation is to be re-established on a harvested plantation site, harvesting debris should, where practicable, be retained as mulch, rather than being burned. 'Harvesting debris' refers to material that remains on-site following the completion of all extraction, production and marketing operations associated with the harvesting event. There is no intention for this guidance action to discourage the sale and/or off-site use of any harvested material or residue (for example, as biofuel).</p> <p>Site preparation techniques including ripping, ploughing and mounding could be used to promote successful tree establishment and growth, although such techniques must be planned and conducted in such a manner as to not compromise soil stability, or cause sedimentation of waterways or destruction of wetlands.</p> <p>Site preparation by non-mechanical means (such as by spot herbicide treatment) should be considered near waterways, to protect soil values, and be conducted in a way that minimises risks to water quality and river health. Where chemicals are used, refer to section 4.3.2.</p>
<p>Mandatory actions</p> <p>4.3.1.1 If waste timber and debris are to be burned, then burning must minimise damage to retained native vegetation within or outside the operational area.</p> <p>4.3.1.2 Burning must not be conducted under power lines except with approval from the electricity supply and distribution authority.</p> <p>4.3.1.3 Where windrows or heaps are created, soil within them must be kept to a minimum.</p>	<p>When creating windrows or heaps, soil movement can be minimised by using appropriate machinery (such as bulldozers fitted with stick-rake blades or excavators fitted with grabs), and by using skilled operators.</p>

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
4.3.2 Chemical usage	Fertilisers may be applied at establishment and during the life of the plantation to stimulate growth and correct nutrient deficiencies. Chemicals may also be used to limit competition from grasses and weeds to maximise tree growth or to manage tree diseases or nutrient deficiencies affecting tree health.	
	Operational goal	
	Fertiliser and chemicals are only used where appropriate to the site conditions and circumstances and with care for the maintenance and protection of water quality, biodiversity, soil values and neighbouring land uses.	
	Mandatory actions	
4.3.2.1	Chemical use must be appropriate to the circumstance and conducted with due consideration given to the maintenance of water quality, soil and biodiversity. Potential off-site, non-target impacts must be minimised.	The Australian Fertiliser Services Association has developed voluntary codes of practice for the responsible application of fertiliser, to protect waterways and other values. These may assist in efficient and effective fertiliser use. <i>Herbicides: guidelines for use in and around water</i> (Cooperative Research Centre for Australian Weed Management) provides useful guidelines for the appropriate use of herbicides to control weeds near waterways. Where chemicals are to be used, a chemical application plan (that specifies the target, the chemicals, target area application rates, methods and operational controls) may minimise unintended off-target and off-site impacts. It could also address the timing and a process for any notifications.
4.3.2.2	When using herbicides or pesticides in declared Special Water Supply Catchment Areas, the relevant Water Authority must be notified prior to application.	Declared special areas (water supply catchments), also referred to as declared water supply catchments or special water supply catchment areas, are proclaimed under the <i>Catchment and Land Protection Act 1994</i> to recognise designated catchments for water supply purposes. Declaration is initiated by the relevant CMA. Schedule 5 of the Act lists declared special water supply catchment areas. 'The relevant water authority' is the water corporation that draws water from the declared water supply catchment. Water corporations are listed in schedule 1 of the <i>Water Act 1989</i> . This is a notification, there is no requirement for permission.
4.3.3 Plantation health	Plantation health may be promoted through management practices such as thinning, salvage felling, weed, pest and disease control, to ensure the ongoing viability of the stand and avoid impacts on nearby landowners.	

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)		Management guidelines
<p>Operational goal</p> <p>Plantation health is monitored and maintained by employing appropriate preventive, protective and remedial measures.</p>		<p>The risks posed by pest plants and animals, and pathogens and other environmental stresses, to plantation health should be assessed regularly and systematically, so that problems are detected early and appropriate remedial strategies are implemented.</p> <p>Various aspects of plantation health could be monitored and documented (aided by photographic records as appropriate) in assessments including crown and foliage condition, presence of damaging agents and description of damage levels.</p> <p>Successful control or management of plantation health problems may require coordinated action involving adjacent landholders and other forest owners.</p> <p>Nursery stock used for plantation establishment should be carefully screened or treated so as to avoid the accidental spread of weeds, pathogens or pests.</p>
<p>Mandatory actions</p>		
4.3.3.1	If the introduction of an exotic agent is suspected, DEPI's Biosecurity section must be informed.	An 'exotic agent' refers to non-native plant pests, insect or animal pests, and diseases.
4.3.3.2	Where there is a known risk of introducing pests and pathogens, the risk must be minimised through appropriate treatment of equipment when moving from known infected areas.	The risk assessment matrix in Appendix 2 may assist in evaluating the risk (based on its likelihood and consequences) and in identifying appropriate responses.
4.3.3.3	Trees in the vicinity of power lines that are suffering from damage or disease must be removed where they are at risk of falling and making contact with power lines.	'Equipment' refers to any items (such as machinery, vehicles or seedling trays) that could transfer pests and pathogens from one site to another.
		Plantation owners/managers are encouraged to liaise with the relevant electricity transmission or distribution company to determine whether the company or the plantation owner is responsible for tree removal where necessary.

4.4 Plantation roading

This section covers the planning, design, construction, maintenance and use of plantation roads and stream crossings.

Section 4.4 of the code applies to temporary and permanent (plantation) roads, as defined in the code's glossary. Thus 'roads' refers to timber cartage infrastructure (that is, suitable for trucks) leading from coupe landings (or log, chip or other loading sites) to the road network beyond the plantation property or estate, or roading infrastructure otherwise required for the continuing management of the plantation property or estate.

The planning, design and construction of plantation roads can be scheduled to suit the timing of operations they are intended to service. For example, it is acknowledged that **road construction** or upgrading to cater for timber cartage can be deferred until close to the scheduled time of harvesting.

Code provisions for tracks constructed or used for snigging or forwarding logs from within a harvesting coupe to a log landing or loading site are at section 4.5.3.

'Stream crossings' includes crossings of streams and other waterways.

Section 4.4 does not apply to roads that are the responsibility of a road authority as described in the *Road Management Act 2004*, unless an arrangement with the road authority to use such road for plantation operations specifically requires otherwise.

Operational goal

The management of all roads that are part of timber production takes account of environmental and cultural values, the safety of road users and the intended use of the road.

4.4.1 Road planning

Mandatory actions

4.4.1.1 Road planning for new roads must:

- i. identify and record possible environmental risks and construction difficulties, so that adequate design standards can be used, and so that construction activities can be timed to minimise risks associated with wet weather
- ii. locate roads to minimise risks to environmental values, particularly soil, water quality and river health, during both construction and ongoing road use, while ensuring road user safety
- iii. minimise the number of stream crossings.

'Identify and record' means in a manner that would allow verification of compliance if necessary for code auditing or monitoring requirements.

'Stream crossings' in this instance includes crossings of streams and other waterways.

Plans for permanent and **temporary road(s)** should be based on field inspections, to ensure that all environmentally sensitive locations are identified and appropriate design and construction techniques adopted. The code's glossary defines a **temporary road** as 'a timber-extraction road constructed specifically for use during harvesting and closed at the completion of operations'. For the purposes of this guidance, the description may be extended to include roads constructed or used for plantation establishment or re-establishment that are to be closed at the completion of these operations.

Matching the road route with the topography of the land will minimise earthworks and the potential for adverse water-quality impacts.

Undertaking necessary upgrades on stream crossings along the planned cartage routes within the plantation property boundary will assist in minimising water-quality impacts due to increased traffic volumes.

Periodic reviews of the roading network will help to ensure networks are sufficient for intended uses and comply with relevant standards, and will help identify and treat any risks to environmental values.

Where there is potential Aboriginal heritage present, the development of an Aboriginal Cultural Heritage Management Plan (CHMP), in collaboration with traditional owners and any other relevant Aboriginal group, will assist in identifying and mitigating any impacts on known cultural heritage values.

When planning roading within a plantation, the provision of appropriate fire access routes should be considered.

Road planning

Example of good industry practice

Planning and building permanent roads well in advance of harvesting operations:

- enables them to be located on alignments and grades that provide the required standard of safe access for expected traffic loadings, without compromising water quality or other environmental values
- allows them to be constructed under suitable weather conditions
- allows time for them to become well-consolidated and stable, prior to use
- enables construction to be kept to the minimum necessary to satisfy management requirements (for example, to minimise as far as possible the need for stream crossings).

4.4.2 Road design

Road design includes the consideration of traffic type and volume, surface materials, road shape as well as road infrastructure including culverts, drains, batters, bridges and fords.

Good road design is vital for maintaining water quality. It is important to control the speed (and hence erosivity) of water, and to provide the greatest possible infiltration to trap sediments before discharge into waterways.

Mandatory actions

4.4.2.1 Plantation roads must be designed to a standard capable of carrying anticipated traffic with reasonable safety, and meeting code requirements, particularly water quality.

Important considerations in road design include the season of harvesting, volume and type of traffic, construction standards specified in the planning scheme (or a permit issued under the planning scheme), and the water-quality values to be protected.

On steep slopes, engineering advice will assist in minimising the risk of road failure.

Tracks should be designed with a view to minimising slope and cross fall, to assist drainage. 'Slope' means the longitudinal grade of the track. 'Cross fall' means across the longitudinal direction of the track.

Road design should seek to increase the frequency of road drainage in areas where the risk of soil entering waterways is high.

Drainage design should maximise the use of discharging water to vegetated areas.

Sediment from operational roads is dominated by fine suspended material, therefore infiltration into soil is one of the most effective remedial strategies.

Roads may be designed and managed in accordance with:

- *Road classifications, geometric designs and maintenance standards for low volume roads* (Giumarra 2001)
- *Unsealed roads manual: Guidelines to good practice* (ARRB 2000)
- *Guidelines for assessment of applications for Permits and Licences for works on waterways* (Sinclair Knight Merz 2001).

Bridges should be designed in accordance with *AS 5100 – 2004 Australian Bridge Design Code*.

Where possible, stream crossings should be adequately elevated, and low approaches maintained, so that water drains away from the crossing point and is discharged into vegetated areas, rather than flowing directly down the crossing to the stream channel.

Placing gravel surfacing with a low sediment-generating potential on the road area on bridge approaches, and on unsurfaced bridges or culverts, will assist in reducing impacts on water quality. Where there are extended steep approaches to waterways, extending the length of gravel surfacing may be necessary.

4.4.2.2 All fill disposal areas and embankments must be planned and designed to minimise soil erosion, mass soil movement, and potential water quality deterioration.

4.4.2.3 Stream crossings must be designed according to the nature, size and period of flow (both pre and anticipated post-harvest) and characteristics of the bed and banks of the stream.

4.4.2.4 Appropriate drainage must be provided. Spacing of drainage outlets along a road must take into account soil erodibility, the rainfall erosivity, and the proximity of the road to streams. Energy dissipating structures or silt traps must be used where necessary to reduce water velocity and trap sediments.

Road design should seek to increase the frequency of road drainage in areas where the risk of soil entering waterways is high.

Drainage design should maximise the use of discharging water to vegetated areas. Sediment from operational roads is dominated by fine suspended material, therefore infiltration into soil is one of the most effective remedial strategies.

To avoid turbid water discharge into waterways, energy-dissipating structures, silt traps or other protective measures may be used to discharge water into undisturbed vegetation. Placing adequate drainage structures about 20 m from a waterway will allow discharge onto undisturbed vegetation and maximise the flow distance between the drainage outlet and the waterway.

Additional drainage measures should be considered (such as crowning or cross fall) to ensure that water within 20 m of a waterway discharges into undisturbed vegetation. Where this is not possible, drainage should not enter directly into a permanent or temporary stream without passing through an appropriate sediment control structure (such as a sediment pond or silt trap).

Appendix 1 provides an approach to estimating rainfall erosivity.

Determining run-off volume and depth to assist road drainage design

Determine peak discharge (Q) using the rational method described in *Australian rainfall and runoff: a guide to flood estimation* (Pilgrim, 1987, p 293).

The rational method uses the equation $Q = C \cdot I \cdot A/360$, where:

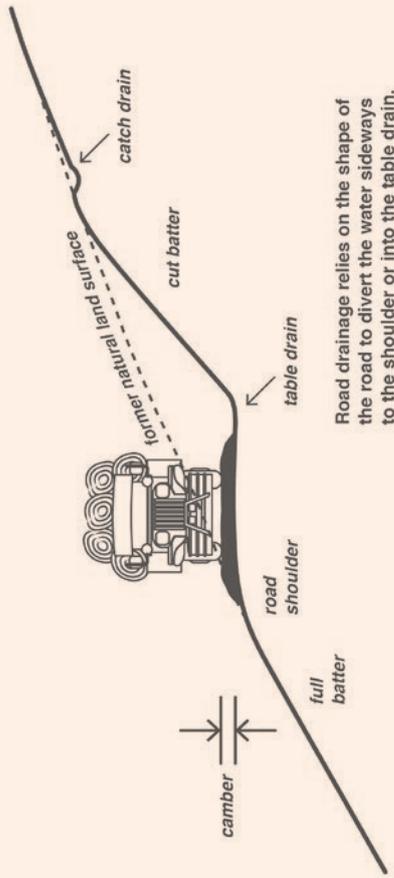
- Q = peak discharge (m³s⁻¹)
- C = run-off co-efficient (0.85 for road surface, 0.1–0.2 for forest)
- I = rainfall intensity (mm hr⁻¹) for design event (1-in-5- or 1-in-10-year recurrence interval)
- A = catchment area.

To convert run-off volume into a minimum depth of water flow, use the V-Notch weir equation (King 1954) $D = 55 \cdot Q \cdot 0.04$ where:

- Q = peak discharge m³s⁻¹
- D = depth of flow in mm.

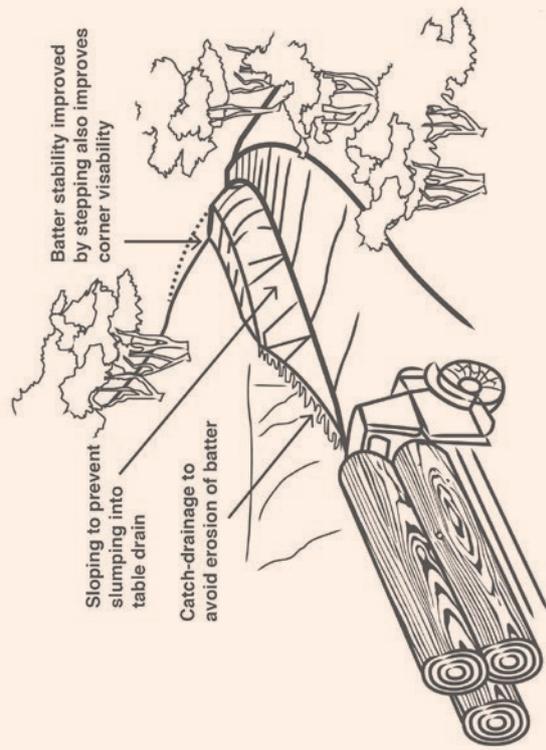
These calculations can assist in determining the appropriate culvert sizes to use during **road construction**.

Road drainage design: Example of good industry practice



Road drainage relies on the shape of the road to divert the water sideways to the shoulder or into the table drain.

Road batter design: Example of good industry practice



Code clauses (Explanatory statements, operational goals or mandatory actions)	Management guidelines
4.4.2.5 Drainage onto exposed erodible soil or over fill slopes must be avoided where possible. Structures and earthworks required to avoid such discharges must be identified during planning and construction as required.	
4.4.2.6 Stream crossings must be appropriately designed to minimise barriers to the passage of fish and other aquatic fauna.	For guidance, see <i>fish passage requirements for waterway crossings</i> (NSW Fisheries 2003), at http://www.dpi.nsw.gov.au/data/assets/pdf_file/0004/202693/Why-do-fish-need-to-cross-the-road_booklet.pdf
4.4.3 Road construction	
Mandatory actions	
4.4.3.1 Road construction must be conducted in a manner consistent with plans and designs.	Road construction should be conducted when rainfall and soil conditions minimise the risk of erosion and the potential off-site impact on water quality.
4.4.3.2 All fill disposal areas must be stabilised and rehabilitated when no longer required.	Stabilisation can be achieved by measures such as, but not limited to, revegetation and the use of erosion-control materials. Additional information can be found in <i>Unsealed roads manual: Guidelines to good practice</i> (ARRB 2000).
4.4.3.3 Adequate temporary stabilisation must be employed to deal with site earthwork drainage and erosion-control if road construction is halted or suspended for any reason.	Stabilisation can be achieved by measures such as, but not limited to, revegetation and use of erosion-control materials. Additional information can be found in <i>Unsealed roads manual: Guidelines to good practice</i> (ARRB 2000).
4.4.3.4 Quarry materials must not be used if known to be infected with <i>Phytophthora cinnamomi</i> .	The likelihood of <i>Phytophthora cinnamomi</i> presence in quarry materials may be indicated by surveying susceptible vegetation species in the vicinity of the quarry for evidence of the pathogen. Refer to <i>A Field Guide to Plantation Health Surveillance in Victoria</i> (DPI 2008) for more information. Where warranted, testing of the quarry material for the pathogen prior to use would provide greater certainty. Testing for <i>P. cinnamomi</i> is available through Forest Health staff at the School of Forest and Ecosystem Science, University of Melbourne.

4.4.3.5 Road construction operations must ensure that:

- i. disturbance to stream beds and banks is kept to a minimum
 - ii. soil and rock fill is not pushed into streams, nor placed into a position where there is a risk that it will erode into a stream
- cement, raw concrete, soil fill and other road making materials are not spilt into watercourses during any construction.

Good construction practices

Examples of good industry practice

- Ensuring that roads are constructed so that water flow or potential water flow along the road surface and/or in table drains does not generate erosive power, by installing drainage structures in accordance with the spacings specified in the table below, allowing for variations based on local experience.
- Determining the capacity of drainage structures (such as culverts, mitre drains and waterway crossings) to cope with 1-in-5-year storm events using the procedure outlined in Guideline 4.4.2.4.
- Dispersing discharge from road drains onto undisturbed vegetation and litter or, when there is no undisturbed vegetation, onto logging slash or, where necessary, onto a specially installed non-erosive surface (such as rock spill, guttering or geotabric).
- Where appropriate, constructing head walls and sediment traps in table drains at culvert inlets.
- Where there is evidence of erosion at drain outlets, adjusting the drain spacing to reduce discharge volumes, or reinstating measures to dissipate or slow the outlet discharge flow (such as rock spill, guttering or straw barriers).
- Keeping the width of vegetation clearance along road alignments to a minimum. Where clearing needs to exceed 3 m from the road edge, the implementation of practices, including:
 - retaining in excess of 70% groundcover
 - retaining and spreading slash so that in excess of 70% groundcover is achieved
 - retaining and respreading topsoil
 - providing artificial groundcover (such as geotextile, straw mulch or erosion-control matting).

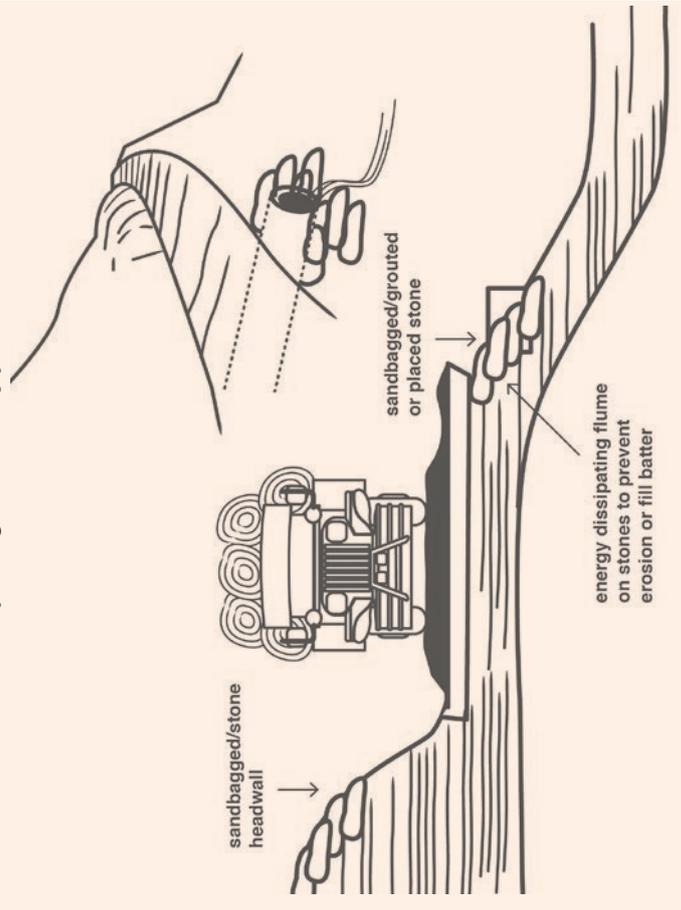
Equipping unstable fill batters over 1 m in height with a drop structure and dissipater for drainage, and/or encouraging their revegetation.

Table 4: Recommended maximum distances (in metres) between run-offs, cross drains and culverts on plantation roads

	Road grade									
	1:50	1:25	1:15	1:12	1:10	1:8	1:7	1:5		
Soil erodibility	1°	2°	3.5°	4.5°	6°	7°	8°	11°		
	2%	4%	6.5%	8%	10%	12%	14%	20%		
	250	170	130	115	100	100	100	100		
Moderate	200	150	120	105	100	100	100	RD		
High	160	130	110	95	80	65	40	RD		

Notes: 1. RD = road discouraged. 2. Soil erodibility can be determined by referring to Appendix 1. Where it indicates that a particular site has very high erodibility, the maximum distances between drainage structures may need to be reduced.

Culvert installation: Example of good industry practice



Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
<h4>4.4.4 Road maintenance</h4> <p>Mandatory actions</p>		
4.4.4.1	Roads used for timber haulage must be maintained to minimise erosion and protect water quality and other environmental values.	<p>Good maintenance practices</p> <p>Examples of good industry practice</p> <ul style="list-style-type: none"> Regular maintenance of the road shape and surface during and immediately following log haulage operations, to maintain the effectiveness of the road drainage system. Where it does not reduce their effectiveness, retaining light vegetation and organic debris within table drains, to trap sediment. Controlling vegetation beside permanent roads, to maintain and improve visibility for drivers. Preventing vegetation from invading the road surface or blocking table drains. Opening regular holes in any soil windrows that form on the outer edge of road verges, to enable water to drain from the road surface. Keeping road surfaces and table drains free of logging slash. Preventing culvert inlets from becoming blocked with soil or slash. Avoiding the unnecessary exposure of soil surfaces on road verges. <p>Many of these maintenance activities can be done manually.</p> <p>Inspecting roads for maintenance problems is best done during wet weather, when drainage issues become more obvious.</p>
4.4.4.2	Road drainage systems must be maintained to minimise erosion and the discharge of turbid water into waterways.	
4.4.4.3	Blading-off of roads is only permitted where measures are in place to prevent potential adverse impacts on water quality and where effective side drainage can be maintained.	

Code clauses (<i>Explanatory statements, operational goals or mandatory actions</i>)		Management guidelines
<h4>4.4.5 Suspension of haulage</h4> <p>Mandatory actions</p>		
4.4.5.1	Heavy vehicle traffic must not use roads in plantations when persistent wet weather or road stability compromise road drainage and water quality.	Central tyre inflation, road watering/rolling and other technology may provide suitable preventive or remedial actions to minimise the risks to water quality of persistent wet or dry weather.
4.4.5.2	Heavy vehicle traffic must not use roads in plantations when persistent dry weather causes the surface materials to unravel to a degree that poses a threat to water quality, in the absence of suitable preventive or remedial actions to manage the risk to water quality.	<p>Road surfacing, and upgrading of stream crossings to protect water quality, can reduce risks to water quality due to road usage in suboptimal periods.</p> <p>Road usage during wet conditions</p> <p>The continued use of unsurfaced earthen roads during wet weather can potentially impact on both their performance and on subsequent maintenance, and affect off-site water quality. These impacts are due to:</p> <ul style="list-style-type: none"> • the formation of ruts, which divert surface water away from drainage structures • the degradation of the road's surface and its shape, which inhibits the rapid drainage of water from the road surface • the mobilisation of sediment, as the formerly compact road surface breaks down into loose particles, which can be readily transported in run-off which may find its way into waterways. <p>Examples of good industry practice</p> <ul style="list-style-type: none"> • Planning harvesting and cartage operations for the drier summer and autumn months, when prolonged periods of wet weather are less likely. • Suspending log cartage when water is running in table drains, or when there is an obvious likelihood of the road surface being damaged by log truck traffic.
<h4>4.4.6 Road closures</h4> <p>Mandatory actions</p>		
4.4.6.1	Roads must be closed (either temporarily or permanently) and effectively rehabilitated where they are no longer required or where their continued use will threaten environmental values.	Stabilisation of road surfaces can be achieved by measures such as, but not limited to, revegetation and the use of erosion-control materials.
4.4.6.2	Roads that are permanently closed must be adequately drained.	<p>Effectively de-commissioning unwanted roads</p> <p>Examples of good industry practice</p> <ul style="list-style-type: none"> • Constructing regularly spaced, earthen cross drains on plantation roads which are to be permanently closed to all traffic, so that water is regularly discharged from the road surface into undisturbed or regenerating vegetation, or into planted areas which can trap sediment. • Stabilising the road surface, batters and fill slopes of permanently closed roads, to encourage their revegetation with appropriate species.

4.5 Timber harvesting

Timber harvesting is the felling of trees, and includes thinning of plantations. Mandatory Actions relevant to timber production that are necessary for the protection of environmental values are described in section 4.2.

4.5.1 Timber harvesting plan

Operational goal

A Timber Harvesting Plan is prepared in accordance with the requirements of this code and submitted to the relevant local government prior to the commencement of timber production.

Mandatory actions

4.5.1.1 A Timber Harvesting Plan must be submitted to local government not less than 28 days before the commencement of any harvesting operations. The 28 day minimum lodgement time may be waived with the agreement of the local government.

4.5.1.2 When preparing a Timber Harvesting Plan the following issues must be addressed:

- i. protection of relevant environmental and cultural heritage values
- ii. methods to minimise impacts on water quality and river health from the operation and associated roads
- iii. any necessary arrangements with the distribution authority for the electrical operational control of power lines during harvesting.

4.5.1.3

The Timber Harvesting Plan must include:

- i. landowners name and address
- ii. the months during which operations are to occur
- iii. estimated timber volumes to be harvested
- iv. proposed haulage routes
- v. a map showing:
 - the plantation or coupe location
 - significant features within the coupe boundary including waterways and any areas reserved or specifically managed for protection of biodiversity or Aboriginal cultural heritage values
 - the area(s) to be harvested
 - new or upgraded roads
 - power lines
 - plantation infrastructure
- vi. conditions applying to the operation, including any permit conditions where required
- vii. fire protection measures.

A Timber Harvesting Plan template for plantation harvesting is provided in Appendix 4 as an aid to plantation owners. Use of this template is not mandatory. Plantation owners are entitled to prepare and lodge a Timber Harvesting Plan in any format that meets the Timber Harvesting Plan requirements stipulated by the code (as above).

Some larger plantation companies have comprehensive generic fire protection documentation for their plantation estate. A LGA may agree to accept such documentation on a periodic basis and have it referred to in Timber Harvesting Plans they lodge, in preference to providing the same extensive information in each Timber Harvesting Plan, provided that, where necessary, any coupe-specific fire protection measures are included in the applicable Timber Harvesting Plan.

The Timber Harvesting Plan may also include information about:

- i. the soil erosion hazard class (or classes) of the coupe area and associated operational restrictions (such as the slope)
- ii. the type(s) of harvesting systems to be employed
- iii. areas within or adjacent to a coupe that are to be excluded from harvesting, or to which special prescriptions apply (such as biodiversity protection, habitat enhancement, landscape protection or protection of Aboriginal cultural heritage) and details of any special conditions or prescriptions appropriate to protecting those areas
- iv. methods to minimise the risk of impact with power lines in the vicinity of the harvesting operations
- v. measures to be employed to protect and rehabilitate soils and to ensure maintenance of water quality
- vi. the locations, design, construction, maintenance and closure of log extraction roads
- vii. the locations and methods of rehabilitation of log landings and dumps and, where necessary, siting and rehabilitation measures for major snig tracks
- viii. ways to minimise impacts on the visual landscape
- ix. seasonal restrictions.

Discretion about what information is included in a Timber Harvesting Plan over and above that required by the mandatory action of the code rests with the plantation owner or nominee responsible for the preparation of the Timber Harvesting Plan, provided that the code is complied with.

For operations near power lines, advice may be sought from the relevant distribution authority regarding necessary precautions, considering the available clearances and terrain in the vicinity of the power lines.

The Timber Harvesting Plan may consider any objectives of regional river health strategies, sustainable water strategies or any water quality plans prepared by the CMA or by Melbourne Water.

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
4.5.1.4	A copy of the Timber Harvesting Plan and any supporting prescriptions must be provided to the harvesting team leader. The plan's implementation, including specific prescriptions to be applied to the plantation, must be discussed with him/her. These documents must be available on-site while timber production is in progress. All amendments and variations to operational requirements (such as the removal of trees from buffers for safety purposes) must be documented in the Timber Harvesting Plan and dated by the harvesting team leader.	It is recognised that a Timber Harvesting Plan may be prepared by the harvesting team leader in some circumstances. It is also recognised that the person assuming the role of harvesting team leader may change during the course of the harvesting operation. Regardless, the current harvesting team leader of the harvesting operation needs to have a copy of the Timber Harvesting Plan on-site while operations are in progress. The harvesting team leader, or other nominee of the plantation owner or manager, may make amendments to the Timber Harvesting Plan during the harvesting operation. Any amendments to a Timber Harvesting Plan need to be such that the Timber Harvesting Plan remains in accordance with the requirements of the code.
4.5.1.5	A Timber Harvesting Plan is current for 24 months following lodgement with the local government.	A Timber Harvesting Plan is current if the harvesting operation(s) to which it relates commence(s) within 24 months of lodgement (receipt by the LGA) of the plan.
4.5.1.6	A Timber Harvesting Plan applies to a single coupe, a number of coupes or to an entire plantation's harvesting operations.	'Entire plantation's harvesting operations' means all plantation harvesting operations conducted by the same plantation owner or manager in an individual local government area, provided the discretion allowed below is exercised by the LGA.
4.5.1.7	Local government may accept the lodgement of a Timber Harvesting Plan for multiple locations and operations rather than individual Timber Harvesting Plans if it is satisfied that the composite Timber Harvesting Plan adequately covers the information required for all coupes included in the plan.	'Multiple locations and operations' means either multiple harvesting coupes on different plantation areas or properties, or multiple coupes in the same plantation area or property.
4.5.1.8	For larger operations covering several coupes over a period of years, a Scheduling Plan may be prepared and submitted (with the agreement of local government), which identifies: <ul style="list-style-type: none"> i. coupe general locations ii. planned operational periods iii. haulage routes iv. expected volumes. 	Submitting a scheduling plan is a practice that is subject to the agreement of the LGA. The value to the LGA of receiving a scheduling plan is that it provides advance notice of planned harvesting operations that may assist in the assessment of, and response to, implications for local roads affected by heavy log cartage traffic.
4.5.1.9	A Scheduling Plan replaces the need to include the information from 4.5.1.8 in a Timber Harvesting Plan. Submitting a Scheduling Plan does not remove the requirement for the remaining items in 4.5.1.3 to be addressed in a Timber Harvesting Plan and submitted at the appropriate time.	
4.5.1.10	A Scheduling Plan is current for up to five years following lodgement with local government, however any significant variations must be communicated to local government prior to their implementation.	'Significant variations' mean changes to coupe general locations, planned operational periods, cartage routes or expected volumes that are likely to alter the LGA's ability to anticipate the implications of the scheduled harvesting operations, particularly on local road infrastructure.

Code clauses (Explanatory statements, operational goals or mandatory actions)		Management guidelines
4.5.2 Timber harvesting		
Operational goal		
Timber harvesting is conducted in a manner appropriate to the site, to manage the impact on soil, water and other values, including biodiversity and cultural heritage.		
Mandatory actions		
4.5.2.1	All timber harvesting operations, including thinning, must be consistent with the Timber Harvesting Plan.	
4.5.2.2	The location of boundaries must be easily distinguishable in the field.	The Timber Harvesting Plan can refer to obvious natural or artificial features (such as drainage features, roads, tracks, plantation boundaries and fire breaks) for boundary identification, that do not require on-site marking for identification.
4.5.3 Plantation infrastructure		
The operation of a harvesting coupe generally requires the development and use of specific infrastructure, including log landings and dumps, and snigging and forwarding tracks. The planning and use of plantation infrastructure must be undertaken in a manner that minimises impacts on environmental values.		
Mandatory actions		
4.5.3.1	Plantation infrastructure (including tracks) must be designed, located, constructed and maintained to minimise potential adverse impacts on soil and water quality.	Rehabilitating tracks and other infrastructure at the earliest opportunity will minimise the risk of wet-weather events creating unacceptable water-quality outcomes.
4.5.3.2	The placement of log landings and dumps must avoid areas that have been excluded from harvesting specifically for the purpose of protecting or managing values such as biodiversity conservation, waterways or cultural heritage..	A site used for in-field chipping would be regarded as a log landing unless there is no significant soil disturbance associated with its establishment or use (refer to the code's glossary definition of 'landing'). A 'log dump' is an area where logs are stockpiled for later transport from the plantation that does not fit within the definition of 'landing' in the code's glossary. 'Areas that have been excluded from harvesting' means areas within or adjacent to a coupe that are shown on the Timber Harvesting Plan to be excluded from harvesting for any reason (including: water quality, river health and soil protection, biodiversity conservation or habitat enhancement; landscape protection, or protection of cultural heritage), whether the reason is to comply with provisions of the code or other legal requirements, or is at the discretion of the plantation owner or manager.
4.5.3.3	The area of log landings and log dumps must be minimised without compromising safety.	

Code clauses <i>(Explanatory statements, operational goals or mandatory actions)</i>	Management guidelines
4.5.3.4 All infrastructure must be stabilised and rehabilitated to minimise erosion risk upon completion of operations, where not required for future operations. All tracks must be effectively rehabilitated to prevent soil erosion.	Rehabilitation techniques could include draining the site, removing harvesting debris, ripping to reduce compaction and respreading topsoil. Existing topsoil may be stockpiled for use in the rehabilitation of landings.
4.5.3.5 Extraction and forwarding tracks must be located to minimise potential adverse impact on soil and water quality and maintain effective drainage to prevent soil erosion. They should be placed at the greatest practicable distance from waterways, without compromising safety.	
4.5.3.6 Tracks must have effective drainage to prevent soil erosion. Cross drains, where used, must be spaced and angled to prevent surface run-off and subsequent discharge of turbid water into streams or drainage lines.	
4.5.3.7 Snigging and forwarding tracks must not be bladed off where this would result in an adverse impact on water quality or the loss of topsoil from the site.	
4.5.4 Operational restrictions	
Operational goal	
During or following wet weather conditions, timber production is modified or where necessary suspended to minimise risks to soil and water quality values.	
Mandatory actions	
4.5.4.1 Harvesting operations must be restricted or stopped where there is a risk to soil and water quality values during or following wet weather conditions.	<p>'Timber harvesting' includes tree felling, log snigging and forwarding, and the sorting, loading and cartage of timber. The actual timber harvesting operations that may need to be restricted or stopped during or following wet-weather conditions would depend on risk assessments conducted for the specific harvesting location and conditions.</p> <p>Soil and water-quality values are at risk of being compromised when surface water run-off transports suspended sediments generated in the harvest coupe to nearby drainage lines. The potential quantity and duration of suspended sediment movement are important risk factors. The risk is increased where compacted soils lead to channelised water flow. Soil compaction is more likely if machinery operations are conducted when soil is wet.</p> <p>A range of techniques to assist harvesting (such as flotation tyres and the use of harvesting slash on extraction tracks) can be used to extend the operational window for compliance with the code, while minimising the impact of the operation on environmental values.</p>
4.5.4.2 Extraction, forwarding and haulage must be suspended when water begins to flow along tracks, except where appropriate preventive actions have been taken to address risks to off-site water quality.	When significant compaction, rutting or soil mixing is likely to occur, on landings or tracks, the suspension of extraction, forwarding and carting operations will protect on-site soil and water quality.

5. Legislation relevant to private forestry

The State of Victoria and the Commonwealth have laws which are relevant to particular activities associated with timber production on private land. To assist the forest owner and manager, this guideline identifies some legislation, regulations and codes that must be observed. The list may not be comprehensive and obligations may change during the life of this publication. It is the responsibility of the user to ensure all relevant legal requirements are met.

The reader should not rely on these guidelines for an accurate statement of current laws and policies that may be in force at a particular time.

While local government are regulators of the code, they are not responsible for ensuring adherence with legislation that is not their statutory responsibility. The responsible authority is listed next to the legislation in Table 5.

Local government is responsible for their local planning scheme.

Table 5: List of laws not prescribed in the Code of Practice for Timber Production 2014

Legislation	Responsible authority
<i>Aboriginal Heritage Act 2006</i>	Aboriginal Affairs Victoria
<i>Agricultural and Veterinary Chemicals (Control of Use) Act 1992</i>	Department of Environment and Primary Industries
<i>Country Fire Authority Act 1958</i>	Country Fire Authority
<i>Electrical Safety Act 1998</i>	Energy Safe Victoria
<i>Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)</i>	Department of Sustainability, Environment, Water, Population and Communities
<i>Extractive Industries Development Act 1995</i>	Department of State Development, Business and Innovation
<i>Occupational Health & Safety Act 2004</i>	WorkSafe
<i>Road Management Act 2004</i>	VicRoads, local government as a road authority
<i>Water Act 1989</i>	Department of Environment and Primary Industries
Victoria Planning Provisions	Department of Transport, Planning and Local Infrastructure. Local government for local planning scheme.

The following legislative provisions may be relevant to Chapters 3 and 4 of the code.

5.1 Legislation relevant to private native forests

5.1.1 Section 3.1 of code (Forest planning)

A planning permit is required from the LGA for timber production in native forest on private land. The planning permit must be approved prior to operations commencing. The Timber Harvesting Plan is assessed as part of the approval.

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal Cultural Heritage Management Plan (CHMP), undertaken in collaboration with traditional owners and any other relevant Aboriginal groups, may be required.

There may be requirements for protecting or minimising the impacts on water availability set out in the *Water Act 1989* or *Catchment and Land Protection Act 1994*. These may be reflected in regional catchment strategies and regional river health strategies prepared by the relevant CMA, or planning schemes prepared by the LGA.

5.1.2 Section 3.2.1 of code (Water quality, river health and soil protection)

Measures to reduce the impact of timber harvesting on water quality and river health must take account of other requirements set out in special area plans made under the *Catchment and Land Protection Act 1994*. Any particular requirements to increase buffers due to the location of a water supply offtake point, or any other relevant requirements set out in special area plans, must be observed.

Stream crossings must be designed to comply with the *Water Act 1989*. Works, including stream crossings, on designated waterways require a works on waterways permit from the relevant CMA.

The *Catchment and Land Protection Act 1994* requires all landholders to control pest animals and noxious weeds on their property.

The *Environment Protection and Biodiversity Conservation Act 1999* includes provisions to protect matters of national environmental significance, including listed threatened species and endangered ecological communities.

The *Wildlife Act 1975* contains provisions to protect wildlife and includes requirements relating to the control of wildlife species causing damage.

Planning approval is required to remove native vegetation (clause 52.17 of planning schemes) and planning schemes may also contain additional requirements for the protection of biodiversity.

5.1.3 Section 3.2.2 (Conservation of biodiversity) and 3.2.3 (Forest health) of code

Chemicals

The use of chemicals for the control of pests and pathogens must be in accordance with relevant Commonwealth and State legislation, regulations, statutory codes of practice, instructions printed on product labels and any off-label permits. In particular, chemical use must comply with the relevant provisions of the *Agricultural and Veterinary Chemicals (Control of Use) Act 1992* and associated regulations.

Pest plants and animals

Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the **landowner** to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

5.1.4 Section 3.3 of code (Roading)

Local government is generally the road authority under the *Road Management Act 2004* responsible for municipal roads. The road authority must manage roads for which it is responsible, in accordance with the requirements of the Act and any regulations or codes of practice made under that Act.

5.1.5 Section 3.3.1 of code (Road planning)

Consistent with the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment, undertaken in collaboration with the relevant traditional owners, may be required.

The development of an Aboriginal cultural heritage plan, in collaboration with traditional owners and any other relevant Aboriginal group, will assist in identifying and mitigating any impacts on designated cultural values.

Threatened species may be protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth), or be the subject of an interim conservation order under the *Flora and Fauna Guarantee Act 1988*.

Road planning, including approval for stream and drainage line crossings, must comply with the *Water Act 1989*, the *Catchment and Land Protection Act 1994*, the planning scheme and any conditions of planning permits (refer clause 52.18 of planning scheme about the repair of municipal roads).

5.1.6 Section 3.3.2 of code (Road design)

Stream crossings must be designed to comply with the *Water Act 1989*. Works, including stream crossings, on designated waterways require a works on waterways permit from the relevant CMA. Guidelines for assessment of applications for Permits and Licences for works on waterways (Sinclair Knight Merz 2001) provides further information.

5.1.7 Section 3.3.3 of code (Road construction)

Known Aboriginal cultural heritage places must be properly identified in the field and appropriately marked and buffered from disturbance, in accordance with any CHMPs prepared under the *Aboriginal Heritage Act 2006*.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant regulations and codes of practice prepared under that Act.

All quarries, gravel and borrow pits must be in accordance with the *Extractive Industries Development Act 1995*, the planning scheme, the *Catchment and Land Protection Act 1994* and any associated regulations.

5.1.8 Section 3.3.4 of code (Road maintenance)

Management of vegetation beside permanent roads that remain open must comply with the requirements of the planning scheme and the conditions of any planning permit.

Under clause 52.18 of the planning scheme, forest owners or managers are responsible for restoring any municipal roads that are used as a haulage route to the same condition they were in before the start of harvesting operations, to the extent of any damage caused as a result of the timber haulage operations.

5.1.9 Section 3.4.1 of code (Timber harvesting)

Known Aboriginal cultural heritage places must be properly identified in the field and appropriately marked and buffered from disturbance, in accordance with any CHMPs prepared under the *Aboriginal Heritage Act 2006*.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

All timber harvesting must comply with the requirements of the planning scheme, the approved Timber Harvesting Plan and the conditions of any planning permit.

5.1.10 Section 3.4.2 of code (Coupe infrastructure)

Under the *Country Fire Authority Act 1958*, harvesting may be prohibited in periods of high fire danger.

Safety – not in code

Operations must comply with the requirements of the *Occupational Health and Safety Act 2004*, regulations made under that Act and any relevant compliance codes.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant regulations and codes of practice prepared under that Act.

5.1.11 Section 3.5.1 of code (Regeneration)

Use of pesticides in site preparation and/or seedling or regrowth/advanced growth liberation must comply with Commonwealth and State legislation and regulations.

Under the *Wildlife Act 1975*, browsing native animals that threaten regeneration may only be controlled under permits and in accordance with any associated conditions, as issued by relevant authorities.

Use of fire must be in accordance with the *Country Fire Authority Act 1958* and any associated regulations, planning provisions and any planning permit conditions.

5.1.12 Section 3.5.2 of code (Stocking assessment and remedial treatment)

DEPI's *Permitted clearing of native vegetation – Biodiversity assessment guidelines* indicates required regeneration quality standards for clear-fell and selective harvesting operations.

5.1.13 Section 3.5.3 of code (Tending)

Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the **landowner** to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

The use of chemicals for stem injection must be in accordance with relevant Commonwealth and State legislation, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Agricultural and Veterinary Chemicals (Control of Use) Act 1992* and associated regulations.

5.2 Legislation relevant to private plantations

According to Section 52.18-2 of the Victoria Planning Provisions (and local planning schemes):

'The code does not apply to agroforestry, windbreaks or other amenity plantings, or to the occasional felling of trees for local uses on the same property or by the same landowner or manager. Small plantations and woodlots of five hectares or less are also exempt from the code, as are plantings established for non-commercial purposes. The code does not apply to revegetation operations conducted for the purposes of erosion or salinity control'.

An area planted for the purposes of timber production in a block of greater than 5 ha would be considered a plantation for the purposes of the code even if it is located on a larger farm used for other agricultural purposes.

5.2.1 Section 4.1 of code (Plantation planning and design)

Fire

Section 41 of the *Country Fire Authority Act 1958* enables a municipal fire prevention officer to serve a fire prevention notice on the owner or occupier of land in respect of anything on that land. Thus, a plantation owner could be issued with a fire prevention notice that required (for example) steps be taken to provide or maintain firebreaks.

The wildfire management overlay provisions of planning schemes may require the preparation of a fire risk management plan by a plantation owner to the satisfaction of the LGA. A fire risk management plan for a plantation may include provisions for the siting and maintenance of firebreaks in respect of that plantation (refer to CFA guidelines).

For plantations greater than 500 ha in size, a forest industry brigade may be required. Provisions relating to the trigger point for, and obligations of, forest industry brigades are contained in the Country Fire Authority regulations 2004, part 5, which are accessible at www.austlii.edu.au.

Protection of landscape values must comply with the requirements of the planning scheme, and any local policies, as applicable. Refer to your relevant municipal strategic statement.

Planning permits

Plantation establishment and management in Victoria are controlled by the planning scheme under the *Planning and Environment Act 1987*. Approval for plantation establishment, where required, must be obtained through the relevant planning scheme. Note that most plantations should not require a planning permit.

Instances where planning schemes may require a planning permit for plantation establishment include when:

- timber production is not specified as a section 1 (permit not required) use in the table of uses for the zone applying to the land concerned
- the proposed plantation does not meet the conditions specified for timber production in section 1 of the table of uses for the applicable zone
- a permit is required under the provisions of an overlay applying to the land concerned
- a permit is required under the provisions of clause 52.17 Native Vegetation.

Unless a planning permit is approved, a plantation must not be located within 100 m of any:

- dwelling in separate ownership
- land zoned for residential, business or industrial use
- site specified on a permit which is in force which permits a dwelling to be constructed.

This 100-metre proximity constraint is a planning scheme provision applying as a condition to timber production in section 1 of the table of uses in clauses 35.07-1 Farming Zone and 35.08-1 Rural Activity Zone. It is deemed to apply only to new (first rotation) plantations being established on land for the first time.

Existing use rights (refer to clause 63 of the relevant planning scheme) apply to plantations as they do to other land uses. Thus, if a dwelling is built, or land zoned as specified above, or a dwelling permit issued for a site, within 100 m of an existing lawfully established plantation, and the plantation owner intends to re-establish a subsequent plantation on the same land as the original plantation within 100 m of the circumstances specified above, a planning permit is not required.

Native vegetation

Any removal of native vegetation for plantation development must comply with the Victoria Planning Provisions and the local planning scheme, as applicable. This may require the provision of offsets.

Power lines

The plantation must not be within 20 m of a power line whether on private or public land, except with the consent of the relevant electricity supply or distribution authority. Tree clearing in the vicinity of power lines is regulated by the Electricity Safety (Network Assets) regulations 1999. Non-authorized persons are prohibited from working on trees that may fall within up to 6 m of network assets. This minimum separation distance constraint (20 m) between a power line and a plantation is a planning scheme provision. It is deemed to refer to the minimum horizontal distance between any part of a power line structure (including wires) and any part of a tree in a plantation.

Adhering to this requirement at the time of establishment needs to cater for the expected size of trees at maturity / final harvest. There is no standard exception from this requirement based on the intended height of the plantation trees (for example, a Christmas tree plantation), but instances where the height of the trees is judged to not pose a risk to the integrity of an adjoining power line may be taken into consideration by the relevant electricity supply or distribution authority if consent is sought.

Aboriginal heritage

Sites of conservation or Aboriginal and non-Aboriginal cultural heritage significance are protected by law. Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal CHMP, undertaken in collaboration with traditional owners and any other relevant Aboriginal groups, may be required.

Water

Requirements for protecting or minimising the impacts on water availability may be set out in the *Water Act 1989* or *Catchment and Land Protection Act 1994*. These may be reflected in regional catchment strategies and regional river health strategies prepared by the relevant CMA or in planning schemes prepared by the LGA.

5.2.2 Section 4.2.1 of code (Water quality, river health and soil protection)

Any particular requirements to increase buffers due to the location of a water supply offtake point or any other relevant requirements set out in a special area plan under the *Catchment and Land Protection Act 1994* must be observed.

As at December 2013, special area plans had been developed for 46 of the 134 declared water supply catchments. These catchment land use and management plans specify where various land uses may be undertaken, and how they should be undertaken, to minimise any adverse effects on water-related values.

Information about declared water supply catchments with special area plans is available from <http://vro.dpi.vic.gov.au/dpi/vro/vrosite.nsf/pages/landuse-water-supply-catchments>.

Stream crossings must be designed to comply with the *Water Act 1989*. Works, including stream crossings, on designated waterways require a works on waterways permit from the relevant CMA.

Section 188 of the *Water Act 1989* enables bodies such as CMAs to declare a waterway or part of a waterway in its catchment a designated waterway. A designated waterway may be all or part of a river, creek, stream, watercourse, natural channel in which water regularly flows, lake, lagoon, swamp or marsh.

Declaring designated waterways enables CMAs to make by-laws regulating activities carried out on such waterways, including the requirement for works on waterways permits.

Each CMA has its own set of maps that identify the reaches of waterways in the CMA's catchment that have been declared to be designated waterways. Some CMAs have used the waterways mapped on the Vicmap Hydro 1:25,000 hydrology dataset as their reference for designated waterways.

There may be scope for plantation owners to negotiate arrangements with individual CMAs to enable the issue of a works on waterways permit covering multiple stream crossings or other works, provided nominated conditions are met.

5.2.3 Section 4.2.2 of code (Conservation of biodiversity)

Where prepared, **action statements** and/or recovery plans for species listed under the *Flora and Fauna Guarantee Act 1988* and the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) must be adhered to, to the extent that they apply to private land.

Any removal of native vegetation must comply with the native vegetation retention provisions (clause 52.17) of the planning scheme, as applicable.

Under the *Catchment and Land Protection Act 1994*, all landholders have a responsibility to control pest animals and noxious weeds on their property.

The *Wildlife Act 1975* contains provisions to protect wildlife, and includes requirements relating to control of wildlife species causing damage.

5.2.4 Section 4.3.1 of code (Site preparation)

Burning operations

Any burning operations conducted as part of site preparation activities must comply with the *Country Fire Authority Act 1958* and any other relevant Acts, regulations and gazetted codes of practice, as required. Many LGAs have municipal fire plans that provide direction on safe conduct of burning operations.

Aboriginal heritage

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal CHMP, undertaken in collaboration with traditional owners and any other relevant Aboriginal groups, may be required.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

5.2.5 Section 4.3.2 of code (Chemical usage)

Biosolids

Where biosolids or other organic wastes or industrial by-product additives are used, they must be used in accordance with the law and conditions of any required approvals. Application of biosolids should be guided by the EPA publication 943 *Guidelines for Environmental Management: Biosolids Land Application*.

Biosolids (for example, sludge from municipal and industrial waste, including stabilised organic solids derived from the treatment of sewage) may be considered as a fertiliser source. The EPA is the responsible regulatory authority for approvals, where required.

Chemicals

The use of chemicals must be in accordance with relevant laws, regulations and statutory codes of practice. Instructions printed on product labels or any off-label permits issued must be followed. In particular, chemical use must comply with the relevant provisions of the *Catchment and Land Protection Act 1994* and the *Agricultural and Veterinary Chemicals (Control of Use) Act 1992* and associated regulations.

5.2.6 Section 4.3.3 of code (Plantation health)

Under the *Catchment and Land Protection Act 1994*, it is the responsibility of the **landowner** to control and eradicate all declared noxious weeds, and to prevent the spread of, and as far as possible eradicate, established pest animals.

Under the *Wildlife Act 1975*, browsing native animals that threaten plantation establishment or re-establishment may only be controlled under permits and in accordance with any associated conditions, as issued by relevant authorities.

5.2.7 Section 4.4.1 of code (Road planning)

Road planning, including approval for stream and drainage line crossings, must comply with the *Catchment and Land Protection Act 1994*, the *Water Act 1989* and the planning scheme, and any conditions of planning permits (refer to clause 52.18 of the planning scheme about the repair of municipal roads).

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal CHMP, undertaken in collaboration with traditional owners and any other relevant Aboriginal groups, may be required.

Threatened species may be protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cwth) or be subject to an interim conservation order under the *Flora and Fauna Guarantee Act 1988*.

5.2.8 Section 4.4.2 of code (Road design)

Stream crossings must be designed to comply with the *Water Act 1989*. Works, including stream crossings, on designated waterways require a works on waterways permit from the relevant CMA or water authority.

5.2.9 Section 4.4.3 of code (Road construction)

All quarries, gravel and borrow pits must be managed in accordance with the *Extractive Industries Development Act 1995*, the *Catchment and Land Protection Act 1994*, the planning scheme and any associated regulations.

Where discovered, Aboriginal cultural heritage must be identified in the field and appropriately marked and buffered from disturbance, in accordance with any CHMPs prepared under the *Aboriginal Heritage Act 2006*.

In the event of any Aboriginal object, place or human remains being discovered in the course of works, the person in charge of those works must report the discovery in accordance with the *Aboriginal Heritage Act 2006*.

5.2.10 Section 4.4.4 of code (Road maintenance)

Under clause 52.18 of the planning scheme, forest owners or managers are responsible for restoring municipal roads used as cartage routes to the same condition they were in before the commencement of harvesting operations, to the extent of any damage caused as a result of the harvesting operations. An agreed assessment of current road infrastructure condition negotiated by both parties prior to cartage of logs will assist this process. If multiple companies use the same road concurrently there may need to be negotiation based on log volumes and loads.

5.2.11 Section 4.5 of code (Timber harvesting)

All timber harvesting must comply with the requirements of clause 52.18 of the planning scheme and the conditions of any planning permit (where required and as specified in the local planning scheme).

Tree clearing in the vicinity of power lines is regulated by the Electricity Safety (Network Assets) regulations 1999. Non-authorized persons are prohibited from working on trees that may fall within up to 6 m of network assets.

5.2.12 Section 4.5.1 of code (Timber harvesting plan)

Under the *Aboriginal Heritage Act 2006*, an Aboriginal cultural heritage assessment and the development of an Aboriginal CHMP may be required, undertaken in collaboration with traditional owners and any other relevant Aboriginal groups.

Section 52 of the Aboriginal Heritage regulations 2007 describes the circumstances when timber production activities trigger the requirement for a CHMP. A planning permit must be required under the planning scheme for a CHMP to be required for timber production activities. Since current planning scheme provisions do not require a planning permit for timber harvesting of a plantation, harvesting itself will not trigger a requirement for a CHMP.

Where a CHMP was required at the initial establishment phase of a plantation, it is possible that the CHMP contains provisions that must be adhered to during the harvesting of that plantation.

5.2.13 Section 4.5.4 of code (Operational restrictions)

Any known Aboriginal cultural heritage places must be identified in the field and appropriately marked and buffered from disturbance in accordance with any CHMPs (where prepared or relevant).

Other relevant operational restrictions might also be prescribed elsewhere. This may include, but not be limited to, conditions on a planning permit, and restrictions under the *Forests Act 1958*, *Country Fire Authority Act 1958*.

Safety

All operations must be conducted in a manner that meets all safety and duty of care requirements.

All operations must comply with the requirements of the *Occupational Health and Safety Act 2004*, regulations made under that Act and any relevant compliance codes.

Operations must comply with the requirements of the *Electricity Safety Act 1998* and any relevant regulations and codes of practice prepared under that Act.

Appendix 1: Soil erosion hazard and soil permeability field guide and assessment kit

Field guide & assessment kit
Soil erosion hazard & soil permeability
Assessment & classification

Prepared by the Centre for Forest Tree Technology* March 1999

* Input provided by:

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David Cummings, Catchment Agriculture Services, NRE
NRE Field Staff who participated in related workshops

Field guide and assessment kit contents

- Assessment & classification procedure, field sheets and equipment
- Procedure flowchart and soil texture triangle
- Distilled water
- 2 x 500 ml specimen jars with sealable lids, 4x120 ml
- 1.5m measuring tape
- Colour card

Other desirable equipment to supplement the kit could include:

- a spade/shovel and/or a soil auger for soil assessment
- a clinometer for slope and tree height assessment
- reference books, such as
 - Mc Donald R.C. et al (1990), *Australian Soil and Land Survey, Field Handbook, 2nd Ed.*, Inkata Press
 - Forestry Commission of Tasmania (1993), *Forest Practices - Forest Soil Conservation Manual*. Soils
 - Charman P.E.V and Murphy B.W. (Ed.) (1991), *Soils: their Properties and Management - A Soil Conservation Handbook for New South Wales*, Sydney University Press
 - Northcote K.H (1992), *A factual key for the recognition of Australian soils*, Rellim Technical Publications.

Part A: Assessment & classification procedure - soil erosion hazard & soil permeability

Assessment site

Where soil type, depth and permeability are generally uniform over the area to be assessed, an assessment of the soil profile or soil horizon can be carried out anywhere on the area. Uniform soil conditions are usually indicated by uniform forest cover and understorey, as indicated by species and structural development. Where soil type, depth or soil permeability varies then appropriate assessment of this variation is required. A soil auger may be useful to confirm uniformity of soil type and depth. Within these requirements, assessment may take the form of freshly exposing the soil profile to an appropriate depth (the depth that soil disturbance is likely to occur, unlikely to be beyond 80 cm. except for roading side-cuts) for assessing soil erosion hazard, and to a depth of 50 cm. for assessing soil permeability. Soil assessment can be made in a number of ways: by using soil profiles exposed in nearby roading works, or uprooted trees; by digging soil pits where soils are shallow; or a combination of the previous methods.

Soil horizon assessment

A soil horizon is a layer of soil that has different characteristics to those of layers above or below in the soil profile. Horizons are most easily recognised by a change in colour down a vertical profile. Other characteristics that denote horizontal change are texture, structure and amount of organic matter. Boundaries between horizons can be sharp and obvious, or more gradational. The most common profile encountered in forest soils is a dark brown A horizon overlying a lighter coloured B horizon. The A horizon often grades from a very dark, organic rich A1 to a slightly lighter coloured, less organic A2. There will then be a gradual change in colour into the mineral B horizon. These changes are often adequately recognised as topsoil (A horizon) and subsoil (B horizon). C horizons underlie the B horizon, and are essentially weathered rock that hasn't yet broken down into soil.

In the field, each horizon, to the likely depth of disturbance, needs to be assessed. Thin layers (generally < 10 cm thick) are not usually considered to be significant unless they occur at the soil

surface and are therefore particularly important. In some soil types there are specific soil horizons which are at high risk of erosion if exposed/disturbed. If the logging operations do not specifically disturb these horizons then they need not be included in an assessment.

Soil texture assessment (tables A and B)

Soil texture refers to the size distribution of mineral particles finer than 2 mm. In relation to infiltration and permeability, generally, Sands, Loamy sands, Clay sands, Sandy loams and loams have very rapid to moderately rapid infiltration and permeability irrespective of pedality. Increasing clay and to some extent silt content reduces infiltration and permeability dramatically while increasing water-holding capacity. In relation to the susceptibility of soil to breakdown, generally, this increases as the content of non-dispersive clays decreases.

In the field soil texture can be indicated by the behaviour of a small handful of soil when moistened and kneaded into a ball and then pressed out between thumb and forefinger (McDonald et al. 1990). Take a sample of soil sufficient to fit comfortably into the palm of the hand. Moisten the soil with water, a little at a time, and knead into a ball until the soil just fails to stick to the fingers. Add more water or more soil until this condition is reached. The ball is called a bolus. Continue kneading until there is no apparent change in consistency of the bolus, usually a working time of 1-2 minutes. Two factors indicate the texture. The first is the feel of the bolus, and the second is its shearing characteristics. Shearing is determined by pressing the bolus out between the thumb and forefinger, and estimating the length of the resultant soil ribbon. The attached "Field Texture Grade table" indicates texture class based on these characteristics.

Soil aggregate stability assessment (Table A)

Soils can be assessed by wetting soil aggregates or peds and observing their slaking and dispersion. A soil ped is a naturally formed aggregate of soil particles. They can be thought of as clods. Peds vary in size from "crumbs" 2-5 mm in diameter to large clods over 50 mm in diameter. Generally they will be < 50 mm diameter. When wet peds can disperse (lose all their structural entity and disintegrate into ultimate particles), slake (break rapidly into much smaller but still discrete soil aggregates) or remain largely unaffected. Generally, soils that disperse are very erodible, soils that slake are moderately erodible and soils that remain unaffected are only slightly erodible.

In the field this can be indicated by the behaviour of a soil ped when immersed in a transparent container of distilled water (visual assessment). The size of the ped is not important as long as it is large enough to observe its response to immersion. For example, a 2 cm diameter ped would suffice. It is important to place the ped in the container with as little force as possible so as to reduce any breaking up the ped by impact. The container should be left to stand, with no shaking or handling. Slaking can be evaluated after 5-10 minutes, where a collapse of the whole ped into much smaller aggregates would indicate high slaking. Very dispersible soil peds will show dispersion within about 10 minutes and have dispersed completely within 2 hours. Slight dispersibility is indicated by a slight cloudy halo after 2 hours. Extremely stable soils will show no dispersion even by the next day.

Soil structure assessment (Table A)

Soil structure refers to the distinctness, size and shape of peds. Rankings of soil structure are based on the generalisation that highly pedal soils are less easily detached than weakly pedal or apedal soils. In general terms, well structured (friable) clay soils, gravels and coarse sands have low susceptibility to breakdown, massive (but non-dispersive) clays and clay loams are moderately susceptible to breakdown, while dispersive clays, detachable fine sandy clays and silts are susceptible to breakdown.

In the field soil structure can be indicated by determining the grade of pedality and the size of peds (McDonald et al. 1990). This can be indicated by subjecting a handful of soil (moderately moist condition) to a moderate crushing force and observing the remaining peds. Highly pedal soils will break into a few smaller peds that constitute more than 2/3 of the original mass. Moderately pedal soils will break into peds that constitute more than 1/3 of the original mass. Apedal or weakly pedal soils will break into fragments and individual particles. This test is probably the most difficult to describe and assess. If there are uncertainties in using this test or deciding on a structure category, a discussion with a local soil expert would be helpful.

Soil colour assessment (Table A)

Soil colour as indicated by a freshly broken aggregate of moist soil (moisten if soil is dry), can be a useful guide when evaluating soil susceptibility to breakdown. Generally, darker colours indicate that soils are less susceptible to breakdown, while pale 'washed out' colours indicate an increasing susceptibility to breakdown. There are exceptions to this relationship, and if local soils are regarded as being erosion prone from experience, the colour may be disregarded as a guide.

In the field the use of the attached colour chart provides a simple guide to colour classification. These colours are a guide and are not identical to those in formal soil colour charts (e.g. Munsell charts). As soil will often not match perfectly with the colour chart, classify the soil colour to its nearest shade.

Soil organic matter assessment (tables A and B)

Soil organic matter, as indicated by soil colour, a greasy feel and short thick ribbon when textured, can be a useful guide when evaluating soil infiltration and permeability, and soil susceptibility to breakdown. Generally, topsoils have higher levels of organic matter than subsoils. This can assist in the binding of topsoil aggregates and reduce aggregate susceptibility to detachment. Darker soils usually have higher organic matter (e.g. typical surface forest soils that are rich in decaying litter). Roots other than very fine ones are not regarded as organic matter in this context.

In the field, soil organic matter is assessed visually and during the soil texture assessment.

Stoniness of soil assessment (tables A and B)

Stoniness of the soil, referring to coarse fragments >20mm, normally lowers the water-holding capacity of soils, however, this effect is generally counteracted by the higher infiltration and permeability of stony soils compared to soils with no or few stones. Surface stones protect soil aggregates and particles from raindrop splash and detachment and also slow run-off and transportation of detached materials. Subsurface stones act in the same way if exposed by erosion, thereby restricting continued soil loss. In the field, a visual assessment of stones or coarse fragments is made for each horizon.

Soil mottling assessment (Table B)

Soil mottling, as indicated by spots, blotches or streaks of subdominant colours different from the soil matrix colour, can be a reasonable indicator of the drainage status of the soil. Compounds of iron form a range of colours from red through yellow to a blue-grey or green-grey depending on the aeration and drainage status of the soil. Soils having poor drainage may have subsoils which are frequently mottled with reds and yellows, with deeper subsoils having grey bluish and greenish mottles. Mottling may, but not always, reflect poor drainage status, since mottling may be a relic feature, or associated with weathering of parent material. In the field, a visual assessment of mottling development is made.

Depth to impeding layer assessment (Table B)

Depth to an impeding layer, as indicated by depth to (1) marked soil texture contrast into a clay B horizon, or (2) largely impervious parent rock material, has a significant impact on the water-holding capacity of the soil.

In the field, this can be assessed by exposing the soil profile to a depth of 50 cm. or to the impeding layer, whichever is the lesser.

Stand height assessment (Tables B and D)

Stand height refers to the general height of a mature forest stand on the site prior to logging or roading. Generally, taller forests grow on permeable soils which are less erosive.

Erosivity index assessment (Table D)

Erosivity index is derived from average annual rainfall data, including rainfall intensity and duration. For Victoria this is mapped in Figure 1.

Slope assessment (Table D)

Slope throughout the area is assessed, both in an overall sense and also in relation to the length and uniformity of slope.

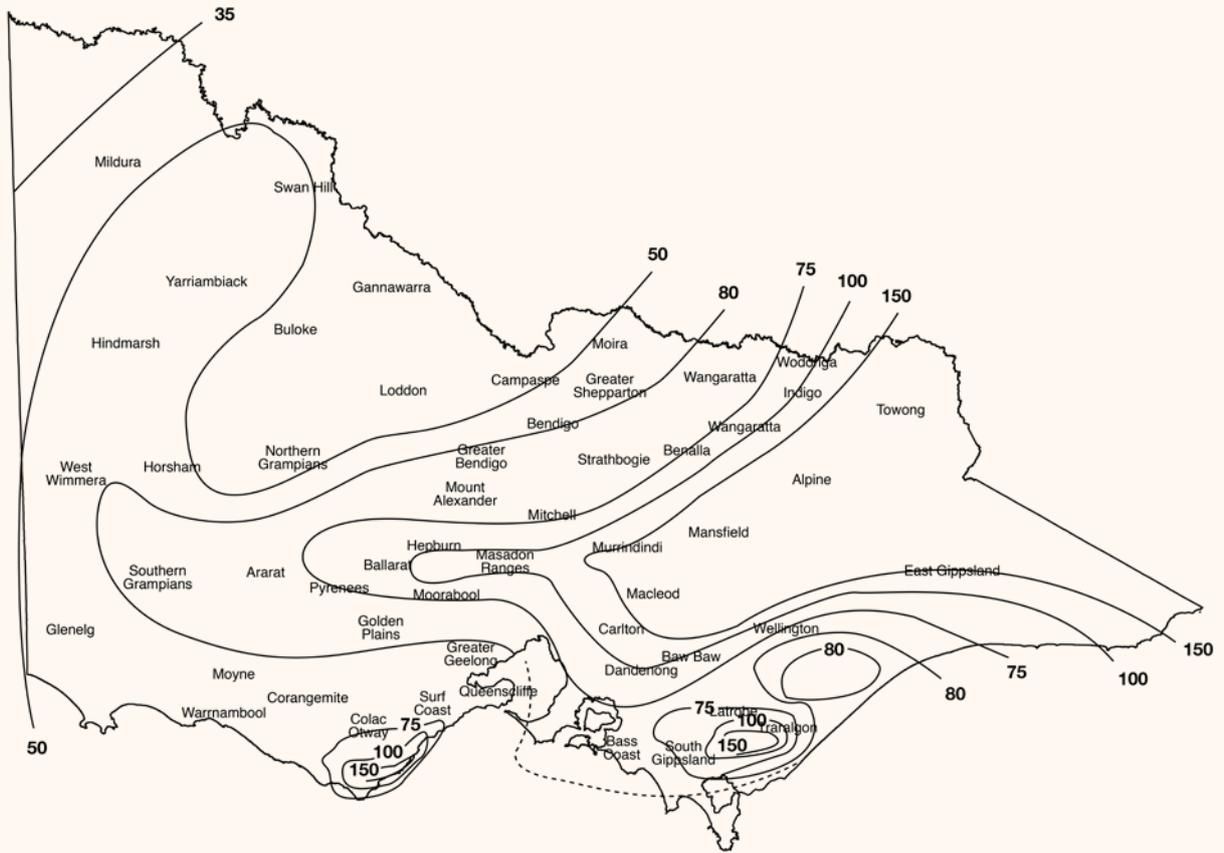
Revegetation capacity assessment (Table D)

Revegetation capacity refers to the capacity of the site to revegetate quickly (within two growing seasons) with good ground cover, which will protect soil from erosive forces.

Table 1: Field texture grade

Field texture grade	Behaviour of moist bolus	Clay content (%)
<i>S</i>	<i>Sand</i> Coherence nil to very slight, cannot be moulded; sand grains of medium size; single sand grains adhere to fingers.	Commonly less than 5%
<i>LS</i>	<i>Loamy sand</i> Slight coherence; sand grains of medium size; can be sheared between thumb and forefinger to give minimal ribbon of about 5 mm.	About 5%
<i>SL</i>	<i>Sandy loam</i> Bolus coherent but very sandy to touch; will form ribbon of 15-25 mm; dominant sand grains are of medium size and are readily visible.	10%-20%
<i>L</i>	<i>Loam</i> Bolus coherent and rather spongy; smooth feel when manipulated but with no obvious sandiness or 'silkeness'; may be somewhat greasy to the touch if much organic matter present; will form ribbon of about 25 mm.	About 25%
<i>SiL</i>	<i>Silty loam</i> Coherent bolus; very smooth to often silky when manipulated; will form ribbon of about 25 mm.	About 25%, silt 25% or more
<i>SCL</i>	<i>Sandy clay loam</i> Strongly coherent bolus, sandy to touch; medium size sand grains visible in finer matrix; will form ribbon of 25-40 mm.	20%-30%
<i>CL</i>	<i>Clay loam</i> Coherent plastic bolus, smooth to manipulate; will form ribbon of 40-50 mm.	30%-35%
<i>SiCL</i>	<i>Silty clay loam</i> Coherent smooth bolus, plastic and often silky to the touch; will form ribbon of 40-50 mm.	30%-35%, silt 25% or more
<i>C</i>	<i>Clay</i> Plastic bolus; smooth to touch; in light clays, slight resistance to shearing between thumb and forefinger, increasing with heavier clays; in medium-to-heavier clays, handles like plasticine and can be moulded into rods without fracture; will form ribbon of >50 mm.	35% or more

Figure 1: Average annual erosivity index, Victoria (Sheridan and Rosewell 2003)



Part B: Field sheet for assessment and classification of (a) soil erosion hazard and (b) soil permeability

Coupe address: _____ Coupe name: _____
 (FMA) (Block) (Comp) (Coupe)

Table 2: Soil erosion hazard classification

Table C classification (from tables A and B)					
Table D rating	V. Low	Low	Medium	High	V. high
Low	LOW	LOW	LOW	MEDIUM	HIGH
Moderate	LOW	LOW	MEDIUM	HIGH	V. HIGH*
High	LOW	MEDIUM	HIGH	V. HIGH*	V. HIGH*

* A V. HIGH classification indicates that the site may not be suitable for harvesting using conventional ground-based systems (that is, rubber-tyred skidder or bulldozer).

Results			
Horizon			
Table C			
Table D			
Classif'n			

Table 3: Soil permeability classification

	Soils with HIGH permeability and low potential for overland flow	Soils with LOW permeability and high potential for overland flow
Table B Score	<18	>18

Results			
Horizon			
Table C			
Table D			
Classif'n			

COMMENTS

Location(s) of sample site(s):

Brief description of soil profile at each sample site:

Variation of soil types over study area:

Other comments

Officer: _____

Date: _____

Table C: Soil erodibility classification

Table A rating					
Table B rating	Low	Medium	High	High	V. high
V. high	V. LOW	LOW	MEDIUM	MEDIUM	HIGH
High	LOW	MEDIUM	HIGH	HIGH	V. HIGH*
Low	MEDIUM	HIGH	V. HIGH	V. HIGH*	V. HIGH*

Results			
Horizon			
Table C			
Table D			
Classif'n			

Table D: Soil erosion site factor – assessment & rating

Site factor	Scoring		
Erosivity Index*	<590	591 – 1469	>1470
Score:	1	3	5
Slope (degrees)	0 – 8	9 – 21	>21
Score:	2	4	7
Slope length / uniformity #	Short uniform	Long broken	Long uniform
Score:	1	2	3
Revegetation capacity **	Good	Moderate	Poor
	LOW <10	MOD 10-14	HIGH >14

Horizon			
Total score:			
Rating:			

* As indicated by Figure 1: Average annual erosivity index, Victoria

** Refers to the capacity of the site to revegetate quickly (within two growing seasons) with good ground cover, following disturbance

Short slopes - <150 m between major (>5°) slope breaks
 Broken slopes - variable, complex or benchy slopes
 Long slopes - >150 m between major (>5°) slope breaks

Appendix 2: Risk assessment matrix

A risk assessment matrix is a tool you can use to assess a risk by evaluating its likelihood of occurring and its potential consequences. This can help you identify the appropriate response and prioritise control measures.

Below is an example of a risk assessment matrix. Other risk assessment approaches may be adopted for this purpose, and users or organisations may apply different judgements about the potential consequences, likelihoods and corrective actions associated with their particular operating environment, in light of the management systems that they already have in place.

How to use the matrix

1. Consider what could go wrong with an activity (i.e., an incident).
2. Determine the potential severity of an incident (consequences).
3. Determine the likelihood of an incident occurring or re-occurring (likelihood).
4. Based on the consequence and likelihood use the matrix to determine the risk level.

		Consequences				
Likelihood	Negligible	Minor	Moderate	Major	Catastrophic	
Rare	L	L	L	M	M	
Unlikely	L	L	M	M	H	
Possible	L	M	M	H	H	
Likely	M	M	H	H	VH	
Almost certain	M	H	H	VH	VH	

Risk level	What should I do?
Very high (VH)	Immediate action required
High (H)	Action plan required, senior management attention needed
Moderate (M)	Specific monitoring or procedures required, management responsibility must be specified
Low (L)	Manage through routine procedures

Consequences

How severely could the incident cause damage?

Catastrophic	very serious, long-term environmental impairment, environmental disaster, huge cost
Major	severe environmental damage, major cost
Moderate	serious, medium-term environmental effects, high cost
Minor	some short-term environmental and financial impacts
Negligible	minor/low environmental and financial impacts

Likelihood

How likely is the incident to occur or re-occur?

Almost certain	expected to occur in most circumstances, more than once a year
Likely	expected to occur on an annual basis, once a year
Possible	might possibly occur at some time, once in five to 30 years
Unlikely	not expected to occur, once in 30 to 100 years
Rare	may only occur in exceptional circumstances, less than once in 100 years

For further information, refer to Australian Standard AS4360: Risk Management.

Appendix 3: Plantation development notice template

Introduction

This model Plantation Development Notice template has been developed to assist plantation owners prepare and lodge a Plantation Development Notice in accordance with the provisions of section 4.1 of the *Code of Practice for Timber Production 2014*.

Section 4.1 of the code indicates the circumstances in which a Plantation Development Notice must be prepared and submitted to the relevant CMA, and what must be included in a Plantation Development Notice. Extracts of some relevant provisions of the code are provided in the notes below.

It is **not** mandatory to use this template to prepare a Plantation Development Notice for plantation establishment. Plantation owners are free to prepare and lodge a Plantation Development Notice in any format that complies with the requirements of the code.

Notes

Timber production on private land in Victoria

Timber production on private land in Victoria is subject to the provisions of the applicable municipal planning scheme. These provisions include clause 52.18 which, amongst other things, requires that all timber production activities (unless otherwise exempted) must comply with the code, to the satisfaction of the responsible LGA.

Relevant extracts from the *Code of Practice for Timber Production 2014*

Description of land to which code applies (section 1.2.4)

'The code does not apply to agroforestry, windbreaks or other amenity plantings, or to the occasional felling of trees for local uses on the same property or by the same landowner or manager. Small plantations and woodlots of five hectares or less are also exempt from the code, as are plantings established for non-commercial purposes. The code does not apply to revegetation operations conducted for the purposes of erosion or salinity control.'

Application of the code (4 Code Application – Plantations)

'Plantations are managed stands of trees of either native or exotic species, planted or sown primarily for timber production purposes.'

Mandatory actions in section 4.1.1.2 and 4.1.1.3, relating to plantation planning and design, reads:

'For new plantations where a planning permit is not required, a Plantation Development Notice must be lodged with the local government not less than 28 days prior to the commencement of site preparation. The 28 day minimum lodgement time may be waived with the agreement of the local government.'

'A Plantation Development Notice must include:

- the landowners name and address
- the total area to be planted
- species to be planted
- year of planting
- a map of the plantation, showing:
 - the location of the plantation
 - any access roads or tracks
 - power lines
 - any **retained native vegetation** within the plantation boundaries.'

Advice to plantation owners

The code defines a 'new plantation' as a plantation development where the previous land use was not plantation. Thus, lodgement of a Plantation Development Notice is not required for the re-establishment of subsequent plantation rotations on the same land.

A primary function of a Plantation Development Notice is to notify a LGA of the intent of the plantation owner to establish and manage a plantation for timber production or other commercial purposes. A plantation owner may choose to lodge a Plantation Development Notice for subsequent plantation rotations, or for a plantation to which the code does not apply: for example, to document that plantation trees have (again) been established with the objective of managing them for timber production (commercial) purposes.

Plantation owners are encouraged to obtain acknowledgment of lodgement of the Plantation Development Notice from the applicable LGA.

Forward this completed Plantation Development Notice to the LGA in whose jurisdiction the plantation will be developed.

Plantation Development Notice

This notice is lodged with the _____ (insert local government authority name) in accordance with the provisions of section 4.1 of the Code of Practice for Timber Production 2014.

Signed _____ (Plantation owner / manager)

Date _____

Section A: Plantation owner

1 Name (company or plantation owner)

2 Name of contact person (if different to above)

3 Postal address

4 Contact number/s

B/H

A/H

Mobile

5 Is the plantation owner also the owner of the land on which the plantation is sited?

Yes

No

If No, provide landowner details at section B below

Section B: Landowner

Complete this section if the plantation owner is NOT the landowner.

6 Name (company or plantation owner)

7 Name of contact person (if different to above)

8 Postal address

9 Contact number/s

B/H

A/H

Mobile

10 Property address on which plantation to be established (e.g. property's rural road number address)

Rural road number

Road name

Rural district (locality)

11 Parish, section, Crown allotment(s) and/or plan of subdivision no. (refer to property title or rates documents)

Parish

Section

Crown allotment / plan of subdivision no.

12 Municipal property no. or other property reference

Section D: Description of the plantation (or woodlot/timberbelt areas)

a) List new plantation(s) being established

b) Optional: list existing plantation(s), if not previously covered by a Plantation Development Notice.

Stand number	Species	Area to be planted (ha)	Year of planting
e.g.	<i>Eucalyptus muellerana</i> (yellow stringybark)		
1			
2			
3			
4			
5			
6			
Total area to be planted:			

Section E: Plantation map

Show plantation area(s) referred to in this notice by drawing on an existing map (e.g. 1:25,000 Vicmap series - enlarged if necessary) and attaching it to this notice, or sketch a location map on this page.

LEGEND:

-----	Access roads or tracks	————	Plantation boundary
x x x x	Power lines	Property boundary
○	Native vegetation	~~~~~	Rivers or creeks
	Other (please specify):		Other (please specify):

MAP REFERENCE:

Map reference (of plantation centre)	Grid reference:	_____
	Map sheet name:	_____
	Map sheet number:	_____
	Scale:	1: _____

Appendix 4: Timber harvesting plan template

Introduction

This model plantation¹ Timber Harvesting Plan template has been developed to assist plantation owners prepare and lodge a Timber Harvesting Plan in accordance with the provisions of section 4.5.1 of the *Code of Practice for Timber Production 2014*.

Section 4.5.1 of the code indicates when a Timber Harvesting Plan must be prepared and submitted to the relevant CMA, and what must be included in a Timber Harvesting Plan. Extracts of some relevant provisions from the code are provided in the notes below.

It is **not** mandatory to use this template to prepare a Timber Harvesting Plan for plantation harvesting. Plantation owners are free to prepare and submit a Timber Harvesting Plan in any format that complies with the requirements of the code.

Plantation owners are encouraged to consider obtaining professional advice when preparing a Timber Harvesting Plan.

Timber production on private land in Victoria

Timber production on private land in Victoria is subject to the provisions of the applicable municipal planning scheme. These provisions include clause 52.18 which, amongst other things, requires that all timber production activities (unless otherwise exempted) must comply with the code, to the satisfaction of the responsible LGA.

The code and Timber Harvesting Plans for plantations

Chapter 4 of the code describes harvesting as the felling of trees, and includes thinning of plantations.

Section 4.5 of the code deals with timber harvesting, and section 4.5.1 with Timber Harvesting Plans. The following extracts are from the code's mandatory actions in respect of Timber Harvesting Plans.

'A Timber Harvesting Plan must be submitted to local government not less than 28 days before the commencement of any harvesting operations.'

'A copy of the Timber Harvesting Plan and any supporting prescriptions must be provided to the harvesting team leader. The plan's implementation, including specific prescriptions to be applied to the plantation, must be discussed with him/her. These documents must be available on-site while operations are in progress.'

'A Timber Harvesting Plan is current for 24 months following lodgment with the local government.'

Section 4.5.1 of the code refers to specific items that must be included in a Timber Harvesting Plan, under mandatory actions. Other items that may be included in a Timber Harvesting Plan are stated under **Management guidelines** in this document.

Advice to plantation owners

A person preparing a Timber Harvesting Plan is encouraged to refer to the code, particularly 4.2 Environmental Values in Plantations, 4.4 Plantation Roding and 4.5 Timber Harvesting. It is recommended that a Timber Harvesting Plan be prepared by, or with assistance from, a person familiar with applying the relevant provisions of the code to timber production in plantations.

The Timber Harvesting Plan represents the plantation owner's instructions to the harvesting operators on how the harvesting is to be conducted in the field. Thus, preparation of a thorough Timber Harvesting Plan is not just a statutory obligation of the plantation owner; it is a means by which the expectations of the owner can be made clear to those responsible for the conduct of the harvesting operation.

¹ The code defines plantations as managed stands of trees of either native or exotic species, planted or sown primarily for timber production purposes.

Notes to the template

These notes should be read in conjunction with Chapter 4 of the code.

Section A: Owner, property and plantation description

This section provides the responsible authority with general information about the plantation owner, the location and features of the plantation to be harvested, and the harvesting and cartage intentions.

Plantation owner

- 1. Plantation owner's name**
Name of the person(s) / company who own(s) the plantation to be harvested.
- 2. Postal address**
Address for correspondence to the plantation owner.
- 3. Contact person's name**
Name of the plantations owner's representative, if applicable.
- 4. Contact numbers**
Contact numbers for the plantation owner or their representative.
- 5. Landowner's name**
Name of the person(s) / company who own(s) the land, if it is different to the plantation owner (for example, if the plantation is on leased land).

Plantation location

- 6. Municipality**
The name of the shire / city in which the plantation to be harvested is located.
- 7. Property address**
The physical address of the property / land, where possible using the property's rural road number address (a) and /or the municipal property no. (b).
- 8. Cadastral and map references**
Describe the location of the area to be harvested (the coupe) by providing the details indicated.
- 9. Land use zone / overlay**
Refer to the relevant municipal planning scheme map to identify how the land on which the plantation is located is zoned, and whether it is affected by an overlay.
- 10. Planning permit no.**
The reference number for relevant planning permit (for plantation establishment) issued, if applicable.
- 11. Water supply catchment**
Indicate if the area to be harvested is in a designated water supply catchment. Further information is on DEPI's website, at www.depi.vic.gov.au.

Attributes of the plantation area to be harvested (the coupe)

- 12. Soil type and erodibility**
A general description (including the soil profile, texture, colour and structure) of the coupe's soils and their relative stability (that is, their proneness to erosion). For example, the description might be, 'Heavy yellow clay, low erosion potential' or 'Gradational sandy loam (granite sand), easily erodible'. Any variation in soil type across the coupe should be noted.
- 13. Slope range**
The range of slopes encountered on the land to be harvested, from the gentlest to the steepest. The slope of the land is measured using a clinometer, or calculated from a large scale contour map, and is expressed in degrees (e.g. min. 12° to max. 25°).
- 14. Plantation species and age**
Indicate the species and stand age of the plantation.
- 15. Area of coupe**
The net area to be harvested, in hectares. This figure does not include areas reserved from harvesting within the coupe boundary.

Harvesting and cartage

16. *Silvicultural system*

Silviculture refers to the management actions undertaken in a plantation to influence its growth, harvest, and regeneration or re-establishment. Here you should indicate the intended harvesting system (e.g. clearfall), and the intended re-establishment method (for example, hand plant with seedlings), where applicable. An intermediate harvest to reduce tree stocking is called a thinning.

17. *Estimated volumes of timber to be harvested*

Estimate the volume (in cubic metres or tonnes) of each type of wood product that is expected to be produced from the coupe (for example, 500 cubic metres sawlogs, 800 cubic metres pulpwood, 300 tonnes firewood).

18. *Harvesting contractor*

Name of the person / contractor / company who will carry out the harvesting operation.

19. *Harvesting equipment*

Description of equipment and techniques to be used to fell trees and extract the logs within the coupe (for example, chainsaw and skidder, harvester and forwarder or chainsaw and cable).

20. *Scheduled harvesting period*

Indicate the anticipated commencement and completion dates of harvesting.

21. *Cartage contractor*

Name of the person / contractor / company who will carry out log cartage from the coupe.

22. *Proposed timber cartage route(s)*

Indicate the road route(s) by which the timber is to be carted, from the coupe to destination(s) or to entry onto a highway.

Section B: Conditions applying to the harvesting operations

The Timber Harvesting Plan needs to indicate how all the relevant provisions of the code are to be applied to the particular harvesting area (coupe) for which it has been prepared.

The operational goals, mandatory actions and guidance set out in the code need to be considered, and appropriate responses explicitly documented in the Timber Harvesting Plan.

Conditions applied to harvesting operations covered by the Timber Harvesting Plan may need to exceed the minimum requirements outlined in the code to reflect other statutory obligations (for example, planning permit conditions and state environmental protection policies), or, where required, to protect environmental values.

The location and nature of many of the conditions to apply to the timber harvesting operations will also need to be indicated on the map that forms part of the Timber Harvesting Plan. Refer to the explanatory notes in section C for guidance on map preparation.

For effective translation of the Timber Harvesting Plan to the on-coupe harvesting operation, it will generally be necessary for the plantation owner to arrange for the location of coupe boundaries, log landings and dumps, road alignments and other areas requiring special attention to be marked in the field.

Any amendments made to the Timber Harvesting Plan after it is prepared and lodged should be noted in the amendment table of the plan, and recorded on the coupe map as appropriate. A copy of the amended Timber Harvesting Plan should be lodged with the responsible authority.

Protection of environmental values (code reference 4.2)

1. *Waterways: water quality and soil protection (code reference 4.2.1)*

Indicate measures to be taken to control timber harvesting operations in the vicinity of waterways to protect them, and any associated riparian vegetation, from disturbance and exposure that could reduce water quality. Also, outline measures that will be undertaken to protect and rehabilitate soils. Specify any restrictions that apply to harvesting and machinery in the vicinity of waterways.

2. *Slope limitations (code reference 4.2.1)*

Specify the maximum slope on which harvesting will be carried out on this coupe. Mark the location of any areas where the maximum slope is exceeded on the coupe map.

3. *Conservation of biodiversity (code reference 4.2.2)*

Specify any other areas where harvesting is to be excluded or restricted for biodiversity conservation purposes (such as areas of native vegetation), and indicate any special conditions or prescriptions appropriate to protecting these areas. Mark these areas on the coupe map.

Roading and cartage (code reference 4.4)

4. Road planning and design (code references 4.4.1, 4.4.2)

Specify the type, location and design standards for any new or upgraded timber roads (including stream crossings) and road infrastructure (such as culverts, drains, batters, bridges and fords). Mark the location of existing, new or upgraded roads on the coupe map.

5. Road construction (code reference 4.4.3)

Specify the construction methods of any new or upgraded timber roads and the location of any quarries, gravel and borrow pits. Specify the design and drainage measures required to minimise soil erosion, mass soil movement, water quality deterioration and landscape impact. Mark the location of any quarries, pits or fill disposal areas on the coupe map.

6. Road maintenance (code reference 4.4.4)

Specify any maintenance works to road surfaces, road edges and road drainage systems, required to protect the road foundation and to disperse and filter water before it enters streams.

7. Suspension of cartage (code reference 4.4.5)

Specify any weather or road surface moisture conditions when roads are to be closed to timber traffic, to avoid threatening water quality or the integrity and serviceability of the road.

8. Road closures (code reference 4.4.6)

Specify any rehabilitation measures to be taken where roads are to be closed, either temporarily or permanently.

Plantation infrastructure – (code reference 4.5.3)

9. Log landings and dumps

Specify any conditions relating to the location, construction and maintenance of log landings and log dumps to minimise soil degradation and water-quality deterioration. Specify the rehabilitation measures to be undertaken on the landings and dumps when the sites are no longer required. Mark the location of log landings and dumps on the coupe map.

10. Snig tracks and forwarding tracks

Specify any conditions relating to the location and use of snig and forwarding tracks to minimise adverse impact on soil and water quality. Outline the rehabilitation measures to be undertaken on snig and forwarding tracks at the completion of harvesting operations. Mark the location of major snig and forwarding tracks on the coupe map.

Other operational measures

11. Wet weather and seasonal restrictions (code reference 4.5.4)

Specify any conditions when timber harvesting operations (particularly snigging, forwarding and landing operations) must be restricted or stopped, when soils are wet and there is a risk to soil and water values (further to the suspension of cartage information at item 7).

12. Power line protection measures

Specify any conditions regarding harvesting operations near power lines (where required).

13. Protection of landscape values

Specify any measures to be taken to protect landscape values.

14. Fire protection measures

Specify any conditions regarding fire protection, including fire-fighting equipment required and restrictions to certain activities on days of extreme fire danger.

15. Other harvesting operational requirements

Specify any conditions relating to aspects of the harvesting operations not covered above. This could also include instructions to the harvesting contractor about matters not covered by the code (such as maximum stump height or log grading standards).

Section C: Coupe map preparation

A map of the area to be harvested (coupe) must form part of the Timber Harvesting Plan (code reference 4.5.1).

Map scale

Ideally, the chosen map scale is such that the area to be harvested occupies approximately 50–75% of the page, when drawn on an A4 sheet. Often, this would mean a map scale of 1:10,000 or larger. A smaller scale map (down to 1:25,000) can be used for larger coupes that are uniform in nature. A map showing contours is preferable. In most instances, a satisfactory base map can be produced by enlarging the appropriate section from a 1:25,000 topographic map (Vicmap series).

Standard map information

Standard map information includes:

- a north arrow
- the map scale
- the source of the map
- a legend showing the map symbols used to represent features and operational conditions.

Coupe and harvesting information

The code stipulates that the Timber Harvesting Plan must include a map showing:

- the plantation or coupe location
- significant features within the coupe boundary, including waterways and any areas reserved or specifically managed for protection of biodiversity or Aboriginal cultural heritage values
- the area(s) to be harvested
- new or upgraded roads
- power lines
- plantation infrastructure (including log landings and dumps, and snigging and forwarding tracks).

Other information that may usefully be shown on a Timber Harvesting Plan coupe map includes:

- other areas excluded from harvesting, or to which special conditions apply
- existing roads and tracks (including roads to be used for log cartage)
- bridges and culverts
- **designated crossings** on waterways for machinery (including **temporary crossings**)
- quarries, pits and fill disposal areas
- soil erosion hazard classes of the coupe area
- fuel dumps and machinery servicing areas
- any existing or new firebreaks.

Supporting information

In addition to the Timber Harvesting Plan coupe map showing the information listed above, the following supporting information is helpful, and its inclusion with a Timber Harvesting Plan is encouraged, where it is available:

- a smaller scale map (1:25,000 or 1:50,000 scale) of A4 size, showing the general locality of the area to be harvested
- a map showing the cadastral details (parish, Crown allotment) of the land on which the harvesting is to occur (refer to DEPI interactive maps)
- a copy of a recent aerial photograph of the area to be harvested.

Timber Harvesting Plan

This plan is lodged with the _____ (insert local government authority name) in accordance with the provisions of section 4.5 of the Code of Practice for Timber Production 2014.

Signed _____ (Plantation owner / manager)

Date _____

Plan lodgement acknowledged _____ (LGA receiving officer)

Date _____

This template provides plantation owners / managers with a suggested format for a Timber Harvesting Plan. The template includes space for responses about mandatory actions that must be included in a Timber Harvesting Plan, as well as responses about any guidance items. The use of the template is not compulsory, and any guidance items included are at the discretion of the plantation owner / manager.

To assist in the completion of this plan, refer to Chapter 4 of the code and to the explanatory notes that accompany this template. Attach additional pages if extra space is required.

Section A: Owner, property and plantation description

Plantation owner

1 Plantation owner's name

2 Postal address

3 Name of contact person
(if different to plantation owner)

4 Contact number/s

B/H

A/H

Mobile

5 Landowner's name
(if not plantation owner)

Plantation location

6 Municipality

7a Property address

7b Municipal property no.

8 Cadastral and map references

Crown allotment /
plan of subdivision no.

Section

Parish

AMG grid reference

1:100,000 map
sheet name

9 Land use zone / overlay

10 Planning permit no.
(if applicable)

11 Area to be harvested in designated water
supply catchment?

Yes No

Attributes of the plantation area to be harvested (the coupe)

12 Soil type and erodibility

13 Slope range (degrees)

min:

max:

14 Plantation species and age

Species

Age

15 Area of coupe (hectares)

Harvesting and cartage

16 Silvicultural system

17 Estimated volumes of timber to be harvested

18 Harvesting contractor

19 Harvesting equipment

20 Scheduled harvesting period

from:

to:

21 Cartage contractor

22 Proposed cartage route(s)

Section B: Conditions applying to the harvesting operations

Protection of environmental values (code reference 4.1)

1 Waterways: water quality and soil protection

2 Slope limitations

3 Conservation of biodiversity

Plantation roading (code reference 4.4)

4 Road planning and design

5 Road construction

6 Road maintenance

7 Suspension of cartage

8 Road closures

Plantation infrastructure (code reference 4.5.3)

9 Log landings and dumps

10 Snig tracks and forwarding tracks

Other operational measures

11 Wet weather and seasonal restrictions

12 Power line protection measures

13 Protection of landscape values

14 Fire protection measures

15 Other harvesting operational requirements

The attached coupe map forms part of this Timber Harvesting Plan.

Plan prepared by:

Timber harvesting plan amendments

Table 1: Amendment table

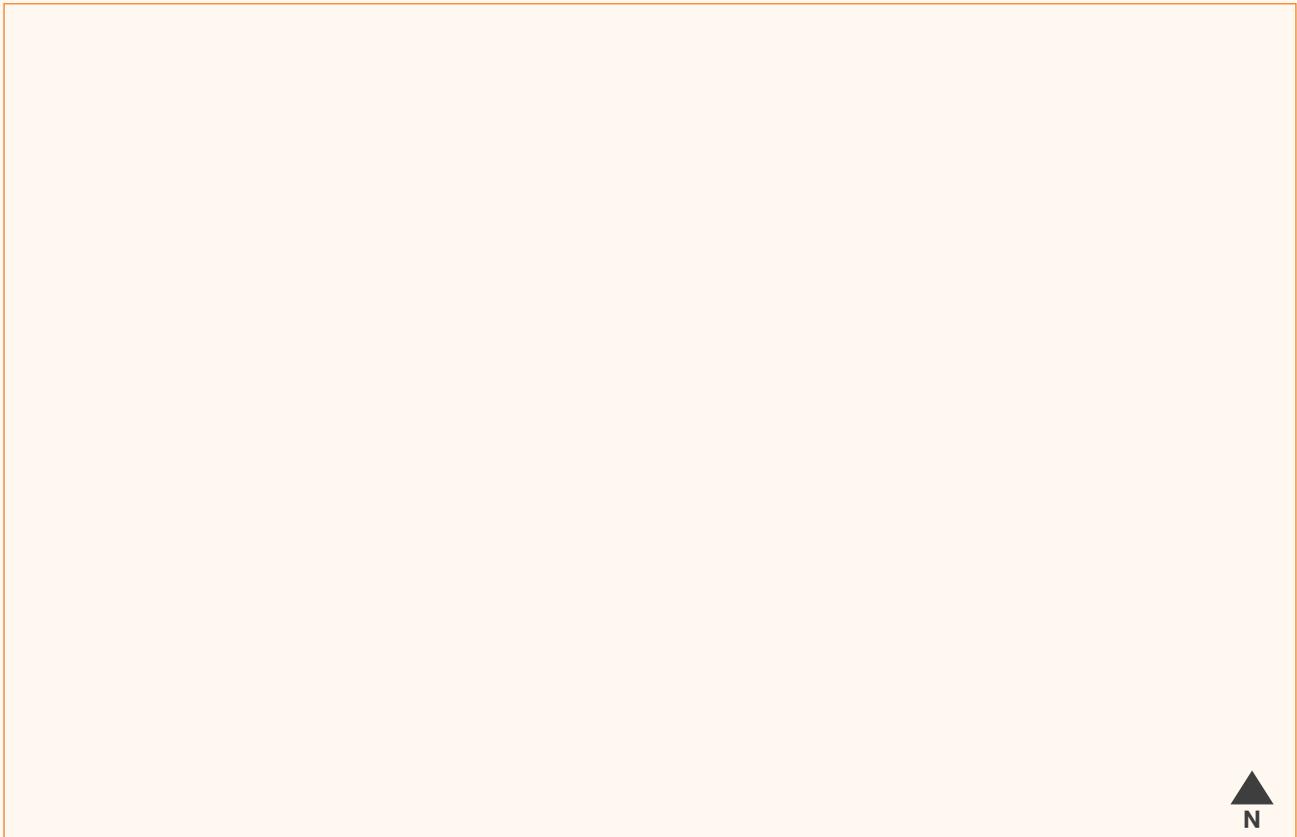
Amendment no.	Date	Timber Harvesting Plan item no.	Amendment

Amendments prepared by _____

Signed _____

Date _____

Section C: Coupe map



LEGEND:

Complete the legend table to show the map symbols used to represent existing features and planned operational requirements.

Coupe boundary		Areas of 30° slope or greater	
Streams, pools and wetlands		Log landings and dumps	
Drainage lines		Snig or forwarding tracks	
Existing roads and tracks		Designated crossings on waterways for machinery	
Roads to be constructed or upgraded		Areas excluded from harvesting	
Bridges, culverts		Other special condition areas	
Quarries, gravel and borrow pits		Fuel dumps, machinery servicing areas	
Power lines		Firebreaks	
Soil erosion hazard classes		Other:	

Scale: 1: _____

Map source: _____

Coupe ID: _____

Customer Service Centre **136 186**

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