

FORESTS NSW

FOREST PRACTICES CODE

Part 3

PLANTATION ESTABLISHMENT AND MAINTENANCE

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Forests NSW

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FORESTS NSW

ENVIRONMENT POLICY STATEMENT

Forests NSW is committed to sustainable forest management while supplying products and services to meet customer expectations and achieve a commercial return. We will manage all our activities in an environmentally, socially and economically responsible manner so as to meet public expectations for maintenance of timber, biodiversity, water, soil, cultural and other values. We are continually seeking improvements in our environmental performance. To meet our policy, Forests NSW will:

- ◆ communicate and consult effectively and constructively with the community, regulators and customers and develop partnerships for co-operative forest management at the strategic level
- ◆ protect and maintain healthy and productive forests to provide enhanced community benefits in perpetuity
- ◆ conserve biodiversity, heritage and cultural values in our native forests
- ◆ adopt environmentally sensitive land management practices for commercial plantations
- ◆ ensure all relevant legislative and regulatory requirements are met
- ◆ ensure that management strategies and operational procedures, including Codes of Practice, facilitate the recognition, mitigation and monitoring of the impact of our activities on the environment
- ◆ motivate and educate our employees and all those associated with Forests NSW to fulfil our environmental responsibilities
- ◆ encourage and assist our suppliers, contractors and other forest users to comply with our environmental standards
- ◆ identify and, where appropriate, adopt best practice in sustainable forest management.
- ◆ be a progressive, adaptive organisation through active research and responding to changing scientific knowledge, public expectations and economic conditions
- ◆ develop and implement efficient energy use and waste management measures in all our activities
- ◆ develop an environmental management system , incorporating an audit program, to internationally accepted standards

Approved July 1996

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PREFACE

The National Forest Policy Statement to which the NSW Government became a signatory in 1992 has as one of its goals - “ The expansion of Australia’s commercial plantations of softwoods and hardwoods so as to provide an additional, economically viable, reliable and high quality wood resource for industry.” Other goals are to increase plantings to rehabilitate cleared agricultural land, to improve water quality, and to meet other environmental, economic and aesthetic objectives.

With the current major restructure of the timber industry in New South Wales, the community will depend increasingly on plantation-grown timber to meet its demand for timber and timber products. Forests NSW, as the major plantation grower in New South Wales, is committed to providing plantation-grown timber both efficiently and in accord with the principles of sustainable forest management. The New South Wales Government has set targets for Forests NSW of:

- establishing 10 000 hectares of eucalypt plantations annually;
- enhancing existing share farming (joint-venture) arrangements for hardwood plantation establishment;
- doubling the size of the softwood plantation estate (currently about 200,000 hectares).

This expansion of plantation establishment will be achieved through the planting of cleared agricultural land.

The Forest Practices Code Part 3 (Plantation establishment and maintenance) is part of the overall Forest Practices Code being prepared by Forests NSW. Part 1 (Timber harvesting in State forest plantations) and Part 2 (Timber harvesting in native forests - Forests NSW and Crown-timber lands) have already been published and complement this part of the Code.

Part 3 of the Forest Practices Code is based on the *Principles for Wood Production in Plantations*, which support the National Forest Policy Statement, and other nationally approved criteria including the *National Strategy for the Conservation of Australia’s Biodiversity (1996)*. This part of the Code also takes account of the regulatory and planning controls which affect plantation establishment and maintenance in New South Wales, as well as State Forest’s own *Environment Policy Statement* which binds all Forests NSW staff and employees.

Part 3 of the Code provides clear guidelines to all Forests NSW staff, employees and contractors, to assist them in their endeavour to create a sustainable viable and environmentally acceptable plantation resource for the benefit of the people and the forest industry of New South Wales.

The Code sets out the minimum standards for establishing and maintaining both exotic conifer and native species plantations. The details for particular aspects of plantation establishment will be found in supplementary documentation and site-specific plans.

Forests NSW managers, employees, contractors and other clients in private and joint-venture plantation projects are expected to use this Code as the benchmark for high quality plantation establishment.

Peter Crowe
General Manager
Softwoods Region

David Ridley
General Manager
Forest Planning and Environment

Bob Smith
Chief Executive
Forests NSW

SCOPE

Part 3 of the Forest Practices Code sets out the minimum requirements and general principles to be followed by Forests NSW' managers, employees and contractors in all aspects of plantation establishment and maintenance. The Code fulfils Forests NSW' obligations to provide rules acceptable to other regulatory authorities, the community of New South Wales and the forest industries, for the conduct of plantation establishment and maintenance operations within publicly owned forests in New South Wales.

The Code adopts the *Forest Practices Related to Wood Production in Plantations: National Principles (1993)*. The Code takes account of all relevant State and Commonwealth legislation and regulation affecting the following aspects of plantation establishment:

- planning and development;
- regulatory and planning approvals;
- worker occupational health and safety;
- environmental protection.

The Code is also guided by State Forest's Environment Policy Statement.

The operational standards set out in this Code are supported by Technical Guidance Notes which describe best practice and which are consistent with the rules set out in this Code. Where necessary, guidelines approved by other regulatory authorities may form the basis for plantation establishment work practices. Where supporting instructions do not exist, it is incumbent upon managers and others to draft relevant instructions, consistent with this Code, which may then be approved and used to sustain the intent of the Code.

The planning and operational standards are designed to ensure:

- good standards of management and workmanship;
- safe working practices;
- efficient and profitable use of capital investment in plantations;
- protection of the forest and its environment;
- protection of assets and other forest uses;
- adoption of international best practice standards in plantation silviculture.

This Code includes rules for all plantation establishment situations including:

- Forests NSW' own plantation program within dedicated Forests NSW and purchased land;
- plantation establishment on leased freehold land or where Forests NSW has entered joint venture agreements with private landholders; or,
- where State Forest's own resources and expertise are used to implement plantation establishment and maintenance operations as a consultant or contractor to private landholders.

The provisions of State Forest's Environment Policy Statement as reflected in this Code are binding on all Forests NSW staff, employees, contractors and consultants. State Forest's other policies on Occupational Health and Safety, Sustainable Forest Management, Commercial Performance and Client satisfaction also underpin the intent of this Code.

Any changes to this Code which are needed because of subsequent changes to legal and statutory requirements, or because of improvements in the technology for plantation establishment, will be advised through the publication of supplements to the Code.

The adoption of this Code or parts of this Code to provide guidance to private plantation growers in New South Wales is commended.

1. LEGAL AND OTHER REQUIREMENTS

1.1 Environment policy

This Code is subject to Forests NSW' Environment Policy and reflects that policy's goals and objectives. The full text of the Environment Policy Statement is reproduced on the inside cover of this Code.

1.2 Principles of Environmental Care

Forests NSW NSW is committed to managing its plantations in accordance with the Principles of Environmental Care (*Forest Practices Related to Wood Production in Plantations: National Principles*). These principles are listed in Appendix 1.

1.3 Legislation

The Forestry Act 1916 is the principal legislation governing the operations of Forests NSW. The Forestry Act gives Forests NSW NSW power to control and manage forestry areas, to acquire land, to establish and maintain plantations, seed orchards and tree nurseries, to engage employees, to control the use of fire, and to regulate and control the use of roads.

Many of the other laws enacted by the Parliament of New South Wales, and some Commonwealth laws, are applicable to and bind the operations of Forests NSW NSW. A list and short description of all the NSW and Commonwealth legislation relevant to Forests NSW NSW's plantation establishment and maintenance activities is contained in Appendix 2.

1.4 Australian Standards

Forests NSW NSW also operates, either by legislative requirement or in exercise of due diligence, in accordance with relevant Australian Standards and industry Codes of Practice. Appendix 3 contains a list of relevant Standards and Codes.

1.5 Forests NSW' policies

Appendix 4 contains a list of Forests NSW NSW's current policies, manuals and instructions applicable to plantation establishment and maintenance.

1.6 Other Forests NSW' Codes and guidelines

This Code should be read in conjunction with Part 1 of the Forest practices code: Timber harvesting in Forests NSW NSW Plantations, and approved Technical Guidance Notes.

2. POLLUTION CONTROL

Principles

- Water quality (physical, chemical or biological) should be protected by measures controlling change resulting from plantation activities.
- Soil, water catchment, cultural and landscape values should be protected by the careful location, construction and maintenance of roads and tracks and the regulation of their use.

Forest Practices related to Wood production in plantations: National principlesd 1.4, 1.7.

Background

The Environment Policy Statement commits Forests NSW to:

- * ensure all relevant legislative and regulatory requirements are met
- * develop and implement efficient energy use and waste management measures in all our activities
- * encourage and assist our suppliers, contractors and other forest users to comply with our environmental standards

2.1 Control of pollution in plantation establishment and maintenance operations

2.1.1 Air pollution

- a) All site preparation burning, and hazard reduction burning associated with plantation protection, must comply with orders prohibiting burning made by the Environment Protection Authority under section 24 of the Clean Air Act.
- b) Measures must be taken to control any pollution caused by excessive amounts of dust from forest roads.

2.1.2 Water pollution

- forest
- a) The pollution of waterways with sediment produced as a result of operations must be controlled by the measures prescribed in this Code in Chapter 3 (*Soil protection*), Chapter 4 (*Drainage feature management*), and Chapter 13 (*Construction and maintenance of plantation roads, trails and firebreaks*).

b) The pollution of waterways from the application of agricultural chemicals, including biosolids, must be prevented by the provision of buffer strips and the other techniques described in Chapter 15 (*Application of agricultural chemicals*).

2.1.3 *Noise pollution*

The use of machinery during plantation operations must be controlled to prevent noise causing offence to neighbours.

2.2 Use of equipment

2.2.1 *Choice of equipment*

In choosing between equipment and techniques for particular tasks, preference should be given to those having the least potential impact in terms of air, water and noise pollution.

2.2.2 *Restrictions on use of equipment*

The use of machinery and vehicles must be restricted when continued operations in wet or very dry conditions could threaten water quality or the long-term serviceability of roads and tracks, or are likely to damage soil physical properties. Special care should be taken where establishment activities take place on highly erodible or vulnerable soil types (e.g. dispersible soils).

2.2.3 *Training of operators*

All machinery operators and supervisors involved in plantation establishment and maintenance operations must be properly trained and accredited in the techniques and precautions required to prevent soil erosion and pollution.

2.2.4 *Storage and handling of fuels and other hazardous substances*

- a) Fuel and lubricating oils are to be stored and handled in compliance with the requirements of A.S. 1940 - *The storage and handling of flammable and combustible liquids*.
- b) Mobile fuel tanks are not to be located within, or within 10 metres of, a drainage feature protection area.
- c) Transport of fuel and refuelling of equipment must be done in a manner which prevents the pollution of waters as a result of the escape of fuel.
- d) Pesticides and pesticide containers must be stored, handled and transported in compliance with A.S. 2507 - *The storage and handling of pesticides*.
- e) All operators and supervisors involved in handling fuel and substances must be trained in the techniques and precautions required to prevent pollution of water or contamination of land.

2.2.5 Servicing and repairs

All servicing and repairs of equipment must be carried out in a manner which prevents the pollution of waters or contamination of land. Wherever possible servicing and repairs to equipment should be carried out away from the forest.

2.3 Waste disposal

Waste includes tyres, drums, wire rope, oils and fluids, empty chemical containers, spilled or surplus agricultural chemical, liquid waste from washing machinery and other equipment, and any other litter.

- a) Waste must not be buried in the forest.
- b) Waste must be safely stored until it can be removed from the forest. The general work area must be kept free of waste generated during plantation operations.
- c) Waste must be stored in such a way that it poses no risk to other forest users, or any risk of polluting watercourses or contaminating land.
- d) Waste must be removed from the forest at regular intervals during operations, and immediately after the completion of operations in a particular area. Waste must be disposed of in an approved facility.
- e) All equipment washing-down operations must be carried out in a way to prevent concentration of contaminated runoff into drainage lines. Where possible, washing down should be done on bunded, impervious pads where drainage water can be collected into sumps for proper disposal.

2.4 Notification of water pollution events and incidents

Any employee or contractor who detects any pollution of water resulting from a plantation activity must report the incident without delay to the Supervising Forest Officer or the Manager of the Responsibility Centre. The local office of the EPA must be informed of the incident.

3. SOIL PROTECTION

Principles

- Soil stability should be protected by measures which regulate site disturbance.
- Soil, water catchment, cultural and landscape values should be protected by the careful location, construction and maintenance of roads and tracks and regulation of their use.

Forest Practices related to Wood Production in Plantations: National Principles 1.6, 1.7.

Background

The Forestry Act requires Forests NSW to “preserve and improve, in accordance with good forestry practice, the soil resources and water catchment capabilities of Crown-timber lands”.

Soil erosion from poorly constructed or maintained plantation roads reduces the value of these constructed assets, and can degrade catchment water quality.

The productivity of plantation sites can be reduced by soil erosion and by other processes that affect the nutritional and physical suitability of the soil for tree growth. For example, inappropriate management practices may reduce site productivity by compacting soil, destroying soil structure, relocating topsoil, or by accelerating nutrient loss.

The potential for soil erosion is determined by site factors, such as rainfall erosivity, topography and inherent soil erodibility, as well as by management practices, particularly as they affect the amount of soil protection provided by ground-cover.

3.1 Protection of soil in plantation establishment and maintenance operations

3.1.1 Road construction and maintenance

All design, construction and maintenance of plantation roads and tracks must be in accordance with the requirements of the Standard Erosion Mitigation Guidelines for Logging in NSW (*SEMGL*), and Chapter 13 of this Code (*Construction and maintenance of plantation roads, trails and firebreaks*).

3.1.2 Plantation establishment

The following applies to all Forests NSW' plantations;

- a) Whenever possible, and consistent with the requirement for rapid re-establishment of ground cover, mechanical clearing and cultivation operations should be scheduled for the drier seasons of the year, to minimise the chances for soil compaction and puddling, and to maximise soil fracturing during cultivation.
- b) Mechanical operations must cease when the soil is saturated or when surface runoff is occurring.
- c) Where clearing for plantations is required, it should be carried out using techniques that optimise the retention of ground cover and minimise the potential for soil movement, consistent with the requirements for effective tree establishment.
- d) Where practicable, approved low ground impact machinery should be used for plantation clearing and cultivation.
- e) Where stacking or windrowing of heavy debris is required, rakes rather than blades should be used to minimise soil movement. Windrows and stacks must not be pushed into drainage feature protection areas and must be physically separated from them.
- f) Line cultivation should be carried out at a gradient sufficient to avoid ponding as well as excessive water velocities and erosion.
- g) Disposal areas for road drainage water must not be cultivated or disturbed.
- h) Where maximum soil protection is required, and consistent with requirements for effective tree establishment, preference should be given to strip or spot methods of cultivation and weed control, rather than broadcast methods.

Special practices for the control of soil erosion are used for the establishment of eucalypt plantations on the North Coast. These are described in the guideline *Erosion and Sediment Control Strategy for Eucalypt Plantation Establishment on the North Coast of NSW (1996)*, prepared by Forests NSW and the Department of Land and Water Conservation (DLWC). Similar special practice guidelines should be prepared for other plantation regions of New South Wales. They should also be prepared for plantations established in areas of high soil salinity, where high water tables or irrigation techniques are used, or where plantations are located in depositional soil zones (e.g. the Riverina).

3.1.3 Training for operators and supervisors

All machinery operators and supervisors involved in plantation establishment and maintenance operations are to be properly trained and accredited in the techniques and precautions required to control soil erosion, and to prevent water pollution.

4. DRAINAGE FEATURE MANAGEMENT

Principles

- Water quality (physical, chemical, or biological) should be protected by measures controlling change resulting from plantation activities.
- Soil stability should be protected by measures which regulate site disturbance.
- Soil, water catchment, cultural and landscape values should be protected by the careful location, construction and maintenance of roads and tracks and regulation of their use.

Forest Practices related to Wood Production in Plantations: National Principles 1.4, 1.6, 1.7.

Background

Plantation forestry operations in or near drainage features can have a significant effect on water quality. The generally wetter soil conditions in drainage features can lead to excessive soil disturbance during forestry operations, and the short distance from the watercourse reduces the filtering effect.

The potential for degradation of water quality as a result of forestry operations can be reduced by the retention of strips of land with relatively undisturbed vegetation and ground cover along each side of drainage features. These strips are called drainage protection areas. The vegetation and ground cover can be natural, planted non-commercial species, or commercial plantation. The vegetation and ground cover in these areas protect water quality by maintaining bank stability, filtering out sediment and other contaminants, and promoting infiltration rather than overland flow of water.

Additionally, the riparian zones of watercourses, wetlands and lakes can be areas of high biodiversity and habitat value if kept under relatively undisturbed native vegetation. Watercourses, being linear in nature can also provide connective values for nature conservation.

4.1 Plantation drainage protection areas

- (a) Drainage protection areas must be established along all drainage features.

(b) The following specifications are minimum requirements for State Forest plantations. Additional conditions may be set on a Regional basis or after local assessment. Within areas being established to plantations:

i) Drainage features within areas being established to plantations must include drainage protection areas as a strip on each side of the drainage feature with the following minimum widths:

<i>Major water storages</i>	100 metres
<i>Prescribed streams, watercourses and wetlands</i>	20 metres
<i>Drainage lines and drainage depressions</i>	5 metres

ii) The widths of these drainage protection areas must be measured on each side of the feature, along the ground, at right angles to the drainage feature, from the apparent high water level.

iii) The width of protection areas on wetlands must be measured from the edge of the current saturated zone.

iv) Where the width of the protection area as defined above includes an existing road, trail or firebreak that is to be retained, the edge of the protection area shall be taken as the bottom edge of the road, trail or firebreak batter slope adjoining the drainage feature.

4.2 Management of plantation drainage protection areas

Plantation drainage protection areas must be managed to;

- maximise soil protection and the filtering effect provided by perennial vegetation and ground cover.
- minimise the risk of wildfire to the protection area and the adjacent plantation.
- minimise the spread of noxious weeds.

This may involve special prescriptions for plantation site preparation to prevent disturbance and to protect existing ground cover, and the management of vegetation by low intensity burning, restriction of grazing, physical or chemical control of undesirable species, or the planting or seeding of suitable species.

4.2.1 General conditions for management of plantation drainage protection areas

Prior to the commencement of operations, the existing water quality and existing vegetation along all drainage features must be assessed and management options for water quality protection evaluated and specified.

The following conditions apply to all plantation drainage protection areas;

a) No timber or other debris is to be stacked or deliberately pushed into protection areas.

b) Where stacks and windrows are to be burnt they should be separated from retained vegetation in the protection area by a firebreak of sufficient width to prevent fire spreading to the protection area.

c) Any trees or substantial debris falling into watercourses or drainage lines during plantation establishment or re-establishment operations must be removed with minimal damage to the bed or banks.

d) Protection areas must not be deliberately burnt or grazed in the establishment phase (first two years) of the adjoining plantation, to provide more effective filtering while the plantation stabilises. Any subsequent hazard reduction burning should be consistent with a Section 41AB (Bushfires Act) fuel management plan endorsed by the local District Bushfire Management Committee.

e) Plantation fertiliser and pesticide applications must be managed to prevent deposition into watercourses.

4.2.2 Major water storages, prescribed streams, watercourses, wetlands and drainage lines

a) No clearing of native trees is to be carried out within 100 metres of the banks of major water storages, nor within 20 metres of the banks of prescribed streams, watercourses, wetlands or drainage lines. Non-native trees may be cleared.

b) Only approved low impact machinery shall be used for plantation site establishment in protection areas.

c) Protection areas may be established using line cultivation techniques but spot cultivation and spot herbicide techniques should be used wherever practicable. Any use of herbicides in protection areas shall be in accordance with label directions and regulatory guidelines prepared by State and Commonwealth agencies.

4.2.3 Plantation drainage depressions

a) Drainage depression protection areas may be cleared and planted with commercial plantation.

b) Machinery may operate in drainage depression protection areas, as long as soil exposure is minimised, and no disturbance is carried out which could cause channelled flow.

4.3 Training for operators and supervisors

All machine operators and supervisors involved in plantation establishment and maintenance operations are to be properly trained and accredited in the techniques and precautions to control water pollution and maintain water quality.

5. SAFETY

Principles

- All plantation establishment, management and utilisation activities will be conducted to comply with relevant occupational health and safety legislation and policy. In particular, all operators should be trained to designated standards in the safe and efficient use of equipment and machinery, and be responsible for safe working practices.

Forest Practices related to Wood Production in Plantations: National Principles 2.1.

Background

The NSW Occupational Health and Safety Act sets out the responsibilities of various parties at an industrial worksite. In particular, it is the employer who has the obligation to ensure the health, safety and welfare of employees and other persons at the place of work.

5.1 Employer responsibilities

Within areas being established to plantations;

- a) Forests NSW and other employers carrying out work on behalf of State Forests must ensure the health, safety and welfare at work of all their employees. This includes providing safe equipment and systems of work, arrangements for safe use, handling, storage or transport of plant and substances, and safe places of work.
- b) All plantation operations carried out by or on behalf of Forests NSW must comply with the provisions of Forests NSW' *Safety Standards Manual*, and other State Forest policies and instructions, legislation, Australian Standards, and Codes of Practice relating to occupational health and safety.

5.2 Employee responsibilities

All employees of Forests NSW, or employees of contractors doing work on behalf of Forests NSW, must report any dangerous work situation, take reasonable care for their own health and safety, and of other persons and the general public at the workplace, and co-operate on any matters of occupational health and safety.

5.3 Provision of safety training

- a) All persons must receive adequate and appropriate information, instruction, training and supervision in relation to the work performed. This must include, where appropriate, training in environmental care.
- b) No person shall operate any power driven tool, machine or equipment without competent supervision unless that person has been adequately trained and instructed in its operation and is capable of operating it safely without supervision.

5.4 Accreditation

- and a) All operators of vehicles and machinery must be trained, accredited and licensed to the minimum relevant legislative standard (RTA or WorkCover).
- a b) All persons required to handle and apply, or to supervise the handling and application of agricultural chemicals must be trained and accredited to standard at equivalent to the *National Farm Chemical User Accreditation Course* provided by TAFE.
- c) Forests NSW may require employers to provide certification or other evidence of competence for machinery operators or workers carrying out skilled manual work such as tree pruning and tree planting.
- d) Chainsaw and brushcutter operators must be accredited to a standard approved by Forests NSW.
- e) Unaccredited persons who are in training must only use vehicles and machinery, including chainsaws and brushcutters, under the supervision of accredited persons.
- f) Forests NSW will maintain and have available a register of accredited employees and contractors stating their specific accreditation.

6. USE OF DANGEROUS AND HAZARDOUS MATERIALS

Background

Many materials that are classified as dangerous or hazardous are used in plantation establishment and maintenance work.

Dangerous goods are defined in the Dangerous Goods Act and Dangerous Goods Regulation, and include fuels, gases, explosives and some agricultural chemicals.

A hazardous substance is defined in the Occupational Health and Safety (Hazardous Substances) Regulation as any substance which has the potential to harm the health of persons in the workplace, and includes most dangerous goods, poisons (under the Poisons Act) as well as many other substances.

6.1 Dangerous Goods

6.1.1 Classification of dangerous goods

All managers, contractors and employees must familiarise themselves with the type of dangerous goods they are handling. The classification system is explained in the WorkCover Guidance Note *Classification of Dangerous Goods* and is summarised in Table 6.1

Table 6.1 Classification of dangerous goods

<i>Class</i>	<i>Subclass group</i>	<i>Packaging Description</i>
1	1.1 - 1.6	Explosives
2	2.1	Flammable gases
	2.2	Non-flammable, non-toxic gases
	2.3	Poisonous gases
3	PG1	Highly flammable liquids (BP<35 ⁰)
	PG11	Highly flammable liquids (e.g. petrol)
	PG111	Flammable liquids (e.g. kerosene)
	Class C1	Combustible liquids (e.g. diesel)
	Class C2	Combustible liquids (e.g. lubricants)
4		Flammable solids
5		Oxidising substances
6		Poisonous and infectious substances
7		Radioactive substances
8		Corrosive substances
9		Miscellaneous dangerous goods

6.1.2 *Storage of dangerous goods*

NSW, a) Forests NSW, and persons carrying out work on behalf of Forests must ensure that dangerous goods are stored in facilities that comply with the licensing, construction design, location and other requirements of the Dangerous Goods Regulation.

b) Licensed dangerous goods stores must not be used to store other materials or goods.

must c) Decommissioning of unwanted licensed underground fuel storages be carried out in accordance with the provisions of the Dangerous Goods Regulation and any further conditions imposed by the Environment Protection Authority.

6.1.3 *Transport of dangerous goods*

Vehicles and operators transporting dangerous goods must be licensed in accordance with the Dangerous Goods Regulation and *Australian Dangerous Goods (ADG) Code*.

6.1.4 *Labelling and warning signs*

Appropriate packaging, labelling and warning signs must be used and displayed as prescribed by the Dangerous Goods Regulation and *ADG Code*.

6.1.5 *Records*

Records of receipts and issues of dangerous goods in excess of exemption quantities, and excluding delivery of fuels into vehicle fuel tanks, must be kept in all licensed dangerous goods stores.

6.2 **Hazardous substances**

Aim of the legislation

The Occupational Health and Safety (Hazardous Substances) Regulation aims to protect workers from both the short and long term health effects of hazardous substances and to improve current health and safety practices.

The legislation provides for:

- * the provision of health and safety information to workers
- * assessment of the risks arising from hazardous substances
- * control of the risks

Definition of hazardous substances

A “hazardous substance” is any substance which has the potential to harm the health of persons in the workplace, when used at work. “Use” includes the production, handling, storage, transport and disposal of the substance in the workplace.

Importers and manufacturers have the responsibility of determining whether or not a substance is hazardous, according to criteria published by Worksafe Australia. A *List of Designated Hazardous Substances* is also available from Worksafe. However employers must also consider hazardous substances arising from work activity, for example fumes or dusts.

6.2.1 Labelling of hazardous substances

- a) All persons handling hazardous substances must ensure that they are delivered properly labelled, and that hazardous substances decanted into other containers are also labelled.
- b) All persons receiving articles which may give rise to hazardous substances during use, (for example welding rods), must ensure that they are labelled to indicate the conditions under which hazardous substances may be generated.

6.2.2 Supply of Material Safety Data Sheets (MSDS)

Forests NSW, and other employers carrying out work on behalf of Forests NSW, must ensure that a Material Safety Data Sheet (MSDS) has been supplied and is readily accessible in the workplace to employees who may be exposed to a hazardous substance.

6.2.3 Register and records

- a) Forests NSW must keep a register of all hazardous substances stored, used or produced in the workplace. A MSDS for each hazardous substance obtained from the supplier must also be included on the register. The register must be accessible to all employees who may use, or be exposed to, a hazardous substance.
- b) Forests NSW, or employers carrying out work on behalf of State Forests, must also keep records of:
 - the induction and training of employees who use hazardous materials
 - health risk assessment reports
 - the results of health checks or other monitoring

6.2.4 Assessment of risks in the workplace

Forests NSW must assess the health risk arising from the use of hazardous substances in the workplace. This assessment must be carried out by a competent person, in

accordance with the *Control Code of Practice* and the *Guidance Note for the Assessment of Health Risks Arising from the Use of Hazardous Substances in the Workplace*.

6.2.5 Control measures

Forests NSW must ensure that exposure to hazardous substances at work is prevented or controlled in order to minimise the risk to health. The control measures to be used should be based on the results of risk assessment.

The following “hierarchy of control” shall be used to minimise exposure:

- eliminate the substance
- substitute with a less hazardous substance
- isolate the substance
- use engineering controls (such as ventilation)
- apply safe work practices
- use personal protective equipment

6.2.6 Monitoring and health checks

Monitoring of exposure must be carried out if the risk assessment shows that there is a need. Health surveillance of employees must be carried out if the risk assessment indicates that employees are at high risk of being exposed to a hazardous substance that could cause disease, or that is listed in Schedule 1 of the Regulation (Schedule 1 includes arsenic and asbestos).

6.2.7 Consultation and employees' duties

- a) Forests NSW or other employers carrying out work on behalf of State Forests, must consult with employees on any matters concerned with implementing the Regulation, and also when work practices involving hazardous substances change. Workplace occupational health and safety committees should have access to Forests NSW' *Manual for the Use of Chemicals* and other information about substances used in the workplace and also statistics on injuries, monitoring and health checks.
- b) Employees must co-operate in carrying out the requirements of the Regulation, and must inform Forests NSW or their employer about anything that may affect Forests NSW' or their employer's ability to follow the Regulation.

7. HANDLING AND STORAGE OF AGRICULTURAL CHEMICALS

Principles

- Use of chemicals, such as herbicides and pesticides and other pest control methods in plantation operations will be in accordance with state policies, procedures and approved usage.

Forest Practices related to Wood Production in Plantations: National Principle 7.4

Background

The agricultural chemicals used by Forests NSW include pesticides (herbicides, insecticides and fungicides), fertilisers and biosolids (mainly sewage sludge). Compliance with legislation and best practice guidelines is necessary to prevent harm to people and risk to the environment from the handling and storage of these materials.

7.1 Definition of agricultural chemicals as hazardous substances

All agricultural chemicals used by Forests NSW must be treated as hazardous substances (see Chapter 6). Users must ensure;

- supply of Material Safety Data Sheets (MSDS), where available
- register of materials used
- records (of induction, training, risk assessments and the results of monitoring)
- risk assessments
- appropriate control measures
- monitoring and health surveillance
- consultation with employees

7.2 Handling, storage and transport of agricultural chemicals

7.2.1 Training

All persons required to handle and use agricultural chemicals for or on behalf of Forests NSW, including those who directly supervise handling and use, must be trained and accredited to a standard at least equivalent to the *National Farm Chemical User Accreditation Course* conducted by TAFE.

7.2.2 *Availability of information*

a) All persons using agricultural chemicals must have ready access to MSDS for these chemicals.

b) A copy of Forests NSW' *Manual for the Use of Chemicals* must be easily accessible to all persons handling agricultural chemicals.

c) Agricultural chemicals must be handled and used in accordance with any label directions. All persons using agricultural chemicals must read, have the label directions read to them.

or

7.2.3 *Personal protective equipment and first aid*

a) All persons required to mix or apply agricultural chemicals must wear the protective equipment specified for the purpose on the label or MSDS identified in the risk assessment. The minimum requirement will be;

or

Cotton overalls
Washable hat
Impervious gloves
Heavy duty lace-up boots

Note that some chemicals will require persons to wear impervious clothing, masks and other equipment beyond the minimum set out here. If in doubt, read the label or the MSDS.

c) Clean water, soap and washing facilities must be available at all sites where chemicals are loaded and mixed.

d) Personal hygiene, maintenance of protective equipment and provisions for first aid must be in accordance with the *Manual for the Use of Chemicals*.

7.2.4 *Storage*

a) All storage of pesticides must be in accordance with A.S. 2507 - *The storage and handling of pesticides*. Pesticides classified as dangerous goods must be stored in accordance with the Dangerous Goods Regulation. The dangerous goods store must be licensed if quantities of dangerous goods greater than exemption levels are kept.

drained.
damage

b) Fertilisers and biosolids must be stored in accordance with the relevant WorkCover Code of Practice or EPA guidelines. Where possible storage should be in covered sheds. Open storage locations should be well-waterproof coverings and bunding should be used to prevent water or leaching of bulk fertiliser in open storage.

in

c) Wherever possible mechanical bulk handling systems should be used preference to manual handling.

d) Agricultural chemicals must be stored in their original containers with label directions intact.

e) Accurate records of receipts and issues must be kept for all stores, using the pro-formas in the *Manual for the Use of Chemicals*.

f) The minimum quantities of agricultural chemicals should be kept in store. Stocks should be rotated to minimise length of storage. Regular stocktaking and culling should be carried out to remove unwanted materials. These should be returned to the supplier if possible or disposed of in accordance with relevant codes of practice.

g) Empty or leaking pesticide containers must be disposed of in accordance with relevant codes of practice. Whenever possible containers should be returned for recycling.

7.2.5 Transport

in a) Agricultural chemicals must be transported in minimum quantities in properly secured loads, where necessary protected from the weather, and in accordance with relevant codes of practice, including, where appropriate the Australian Dangerous Goods Code and the provisions of the NSW Traffic Act (see also Chapter 6 and Appendix 2, item 25).

b) Chemicals should be transported by the most direct, safest route.

c) Damaged and leaking containers must not be loaded.

d) Chemicals must not be transported within passenger vehicles or the cabs of trucks or other machinery.

e) The possibility of spills should be minimised by storing and transporting the minimum quantities necessary, and by proper location and supervision of mixing and loading operations.

f) All persons transporting, handling and applying agricultural chemicals must be trained and equipped to deal with leaks and spills in accordance with relevant codes of practice.

8. SITE EVALUATION

Principles

- Native forest should not be cleared for plantation establishment where this would compromise regional conservation and catchment management objectives.
In some circumstances it may be appropriate to clear forests that have been severely degraded by impacts such as disease, weed invasion, wind and fire so as to enable rehabilitation through replanting.
- Values such as intensive recreation, high scenic quality, significant geomorphic, biological or cultural heritage sites should be recognised in the planning of plantation forest operations.
- Fauna, floristic and landscape values should be protected by the careful planning of plantation layout establishment operations and the reservation and protection of appropriate areas of native vegetation
- such values should be recognised in subsequent plantation management.
- The environmental, social and economic effects of all plantation operations envisaged for an area will be considered during the planning process.

Forest Practices related to Wood Production in Plantations: National Principles 1.1, 1.2, 1.8, 3.4.

Background

Forests NSW has been charged by the NSW Government to establish 10 000 hectares of eucalypt plantation annually and to double the size of the present softwoods plantation resource. Selecting suitable cleared agricultural land for these purposes requires a rigorous evaluation process to ensure that the economic viability of investment in plantation projects is maintained, together with the environmental safeguards which government and the community now expect of agricultural and forestry projects.

Site evaluation looks at a number of criteria in depth. These include:

- the intrinsic suitability of the site in terms of climate, soil, and location to markets;
- the environmental management requirements to ensure protection of soil, catchment and water quality, flora and fauna, and cultural heritage values significant to both indigenous and migrant peoples;
- the impact of plantation development on other neighbouring land uses;
- the economic cost benefit of plantation establishment which takes into account mitigating activities to achieve sustainable forest management for plantation

and other values.

The evaluation process may also interact and overlap with considerations for plantation design and the Environmental Impact Assessment process required under the Environmental Planning and Assessment Act (1979). All three are planning activities which have to take place before any action to develop a plantation project commences.

The stages in the evaluation process are:

- Site survey and inspection;
- Soil erosion hazard assessment;
- Water pollution hazard and catchment use assessment;
- Investigation of flora and fauna;
- Identification of land use values according to State Forest's forest zoning system and/or Local Environmental Plans;
- Capital works economic analysis;
- Preparation of native vegetation clearing report;
- Preparation of Environment Impact Assessment as required by the Environmental Planning & Assessment Act (E.P. & A. Act);

If, following the evaluation process, a decision is made to plant, an Establishment Plan is then prepared.

8.1 The evaluation of plantation sites

a) Potential plantation sites must be formally evaluated for their suitability for plantation forestry before arrangements are entered into for purchase or joint venture. This evaluation should consider all relevant environmental, economic and social factors.

b) Commercial plantations must only be established where it can be demonstrated that the soil and climate (including available rainfall and its distribution pattern), is suitable for economic and sustainable growth of the species to be planted.

c) Where non-commercial tree plantations are to be established to meet social or environmental objectives, the social or environmental benefits must be clearly identified and where possible, economically justified.

d) Because soil erosion and water pollution arising from site disturbance during plantation establishment may have significant impact on downstream values, an evaluation of the water pollution hazard and appropriate mitigating measures must be undertaken for all prospective plantation sites.

e) The extent to which an individual plantation project is investigated must reflect the overall size of the plantation in relation to adjacent land use. As a minimum, planting proposals must be fully investigated for individual or isolated areas over 40 hectares, and for areas over 150 hectares which are adjacent to existing plantings.

8.1.1 *Environmental evaluation*

The likely environmental impacts of any plantation establishment proposal must be assessed in accordance with the requirements of Part 5 of the E.P.& A. Act (see Chapter 10). Where assessment indicates that adverse impacts can be mitigated, the costs of this mitigation must be included in the cost benefit analysis.

8.1.2 *Contaminated and degraded land*

Site evaluation should include an audit of possible contamination due to previous land use. The plantation proposal should not proceed if the audit indicates a possibility of contamination falling under the provisions of the Environmentally Hazardous Chemicals Act 1985. Site evaluation must also take into account other land degradation factors that could render Forests NSW liable for remedy if ownership or joint venture involvement is intended. These may include high levels of noxious weed and animal infestation, site potential for major soil erosion and water pollution incidents or other intractable site problems. In such cases, the plantation proposal should not proceed.

8.1.3 *Existing native vegetation*

Background

Forests NSW does not undertake broadacre clearing for plantation establishment. Plantation establishment is exclusively undertaken on essentially cleared agricultural land. However, incidental clearing involving small areas of native forest and other native vegetation may take place to allow plantation establishment to proceed efficiently. Often only individual isolated trees are involved.

The provisions of State Environmental Planning Policy 46 - *Protection and Management of Native Vegetation* (SEPP 46) apply to vegetation clearing undertaken by Forests NSW. It should be noted that the NSW Government proposes to introduce new native vegetation management legislation in 1997 and Forests NSW will obviously conform to the provisions of that legislation.

8.1.4 *Catchment values*

If the plantation will occupy a significant proportion of a town or other sensitive water supply catchment, or if soils are highly erodible, the possible effects of plantation establishment on water yield and quality should be critically evaluated.

8.1.5 *Economic analysis*

Proposals for commercial plantation establishment must be supported by a cost-benefit analysis to demonstrate that the proposal will meet current economic criteria. This analysis must;

- be based on realistic estimates of plantable area, after any environmental exclusions, and realistic estimates of financial returns and establishment, maintenance and protection costs. These assumptions should be tested using sensitivity analysis;
- recognise costs involved in protecting special site values.
- recognise the effects of topography and access on the costs of harvesting and transport.
- where possible use data from plantations growing on closely matched sites for the estimation of productivity and yields.
- consider the possible risks from disease, fire, animal pests and other natural disasters using sensitivity analysis.

8.1.6 *Neighbouring land use*

During site evaluation and plantation design, due recognition must be given to neighbouring land uses and the potential impact that plantation establishment may have on the ecological integrity of neighbouring natural ecosystems and rural infrastructure.

9. PLANTATION DESIGN

Principles

- Values such as intensive recreation, high scenic quality, significant geomorphic, biological or cultural heritage sites should be recognised in the planning of plantation forest operations.
- Soil, water catchment, cultural and landscape values should be protected by the careful location, construction and maintenance of roads and tracks and regulation of their use.
- Fauna, floristic and landscape values should be protected by the careful planning of plantation layout establishment operations and the reservation and protection of appropriate areas of native vegetation
- such values should be recognised in subsequent plantation management.

Forest Practices related to Wood Production in Plantations: National Principles 1.2, 1.7, 1.8.

Background

The physical layout of plantations, including location of roads and boundaries, age sequences and retention of existing vegetation and other cultural, historic or physical features, has a major effect on the landscape and nature conservation values, environmental impact and public acceptance of plantation forestry, as well as on management efficiency and ease of protection.

Landscape and nature conservation values can often be improved by consultation and coordinating design with adjoining landholder's farm plans.

While the primary purpose of plantation establishment is commercial wood production, opportunities are also sought in plantation design to utilise existing native vegetation and potential regeneration to fulfil the dual role of filtering for water quality and connective value for nature conservation. Factors which may be taken into consideration in assessing the opportunities include

- the adequacy of existing vegetation for these purposes;
- its potential to regenerate and remain viable;
- the relative costs of roading pattern alternatives;
- practicalities of fire protection;
- the presence of other connecting vegetation in the vicinity.

9.1 The design of plantations

Plantation design will be considered when the roading system is being designed. The weight placed on the varying factors and the measures taken to enhance landscape and conservation values and mitigate adverse impacts will depend on the location of the plantation.

a) The factors to be considered will include;

- the size and shape of the plantation area in relation to the existing topography and landscape.
- areas visible from critical observer points, such as lookouts, nearby towns and major highways.
- the possibilities to modify highly visible edges with retention of existing vegetation or planting of other species.
- age class boundaries and timing of establishment to minimise the visual and environmental impact of site preparation and harvesting, and the risk of loss due to natural disasters.
- opportunities to enhance connective values of existing native vegetation, particularly along watercourses.
- the presence of important cultural, archaeological, historic, recreational, scenic, geomorphic or biological sites within the plantation area which may be affected by plantation operations, and measures that could be taken to protect these sites.
- intensity, location and design of roads to minimise adverse visual and environmental impacts. This is especially important with large cuts or fills and gravel pits, where relocation, redesign or screening treatments may be desirable to reduce impact.

b) Neighbouring landholders and local landcare groups should be consulted in the design phase of plantation establishment in order to optimise opportunities for enhancement of landscape and nature conservation values.

10. ENVIRONMENTAL IMPACT ASSESSMENT

Principles

- Values such as intensive recreation, high scenic quality, significant geomorphic, biological or cultural heritage sites should be recognised in the planning of plantation forest operations.
- Plantation management should comply with state and regional conservation and catchment management objectives, relevant planning schemes and legislation.
- The environmental, social and economic effects of all plantation operations envisaged for an area will be considered during the planning process.

Forest Practices related to Wood Production in Plantations: National Principles 1.2, 1.3, 1.8, 3.4

Background

Forests NSW is required by the Environmental Planning & Assessment Act (Part 5, Section 111) to “examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment” by reason of its plantation establishment and maintenance activities. This requirement extends to plantation activities carried out by Forests NSW under joint venture arrangements on land owned by other parties.

The factors to be taken into account when consideration is being given to the likely impact of an activity on the environment are specified in Clause 82(2) of the E.P.&A. Regulation. Clause 5(A) of the E.P.&A. Act specifies the factors to be taken into account when deciding whether there is likely to be a significant effect on threatened species, populations or ecological communities or their habitats.

If as a result of this consideration it is decided that an activity is likely to significantly affect the environment, Forests NSW is required to prepare an Environmental Impact Statement (EIS). If it is decided that the activity is on land that is critical habitat or is likely to significantly affect threatened species, populations or ecological communities or their habitats, a species impact statement (SIS) must be prepared in accordance with Division 2 part 6 of the Threatened Species Conservation Act, and the concurrence of the Director-General of National Parks and Wildlife obtained for the activity.

On proposed joint venture plantations on private lands, local council planning provisions may require a Development Application to be lodged. Consent may also be required under Part 4 of the E.P.&A. Act, including consideration of planning instruments that may be scheduled in Local and Regional Environmental Plans and State Environment Planning Policies.

10.1 Preparation of environmental impact assessments

10.1.1 Responsibility for preparation

Environmental impact assessment must be carried out by the administrative office (Responsibility Centre) at which the activity is approved.

10.1.2 Content of environmental impact assessments

with a) Environmental impact assessments must be prepared in accordance with the best practice guideline “Is an EIS required” produced by the NSW Department of Urban Affairs and Planning.

The depth, detail and documentation required in the consideration of the likely environmental impact of a proposed activity will depend on the nature of the activity.

b) Where a change in land use is proposed, for example plantation establishment on agricultural land, a comprehensive *Review of Environmental Factors* (REF) must be prepared, to allow a decision on whether an EIS is required. This review must consider the likely impacts of all planned establishment and maintenance operations, including roading, on the area in question.

c) For most routine plantation maintenance and tending activities, such as weed control, hazard reduction burning and road maintenance, the decision on whether an EIS should be prepared can be based on a checklist of the factors specified in Clause 82(2) of the Regulation and Clause 5(A) of the Act.

10.1.3 Retention of documentation

A register of checklists and REFs should be maintained in the Responsibility Centre to allow auditing of compliance with the requirements of the E.P.&A. Act.

11. OPERATIONAL PLANNING, PERFORMANCE MONITORING AND QUALITY AUDIT

Principles

- Individual plantation operations will be conducted in accordance with relevant codes of practice.
- Where practicable, plantation operations should be supervised and monitored by qualified persons and be subject to audit.

Forest Practices related to Wood Production in Plantations: National Principles 3.5, 8.1.

Background

Formal planning, monitoring and audit of plantation establishment and maintenance operations is essential to meet the regulation and standards mentioned in the Scope of this Part of the Forest Practices Code.

Formal written plans are also essential for efficient communication and field implementation of job requirements and specifications,

11.1 Operational planning

Significant plantation establishment and maintenance operations must be carried out according to written plans prepared by the supervising officer and approved by the Responsibility Centre manager.

In particular, plans must be prepared for;

- All road building and upgrading;
- Plantation establishment;
- Pesticide and aerial fertiliser applications,

and will include;

- **Description** of the work to be carried out;
- **Location** of the work (including a map);
- **Checklist** of legislative and administrative compliance, for example with the E.P.&A. Act, EPA Pollution Control Licence, Pesticides Act, relevant Codes of Practice;
- Detailed **methods and prescriptions**, including **time schedules for operations** and **operational plans or maps** for the work;
- **Safety** requirements;
- Conformity with the annual operating plan and **budget** approvals;
- **Titles** of the supervisors involved in the work;
- Provision for progress and final **reporting** and **auditing**;

- **Signatures** of the preparing and approving officers;

Performance monitoring and audit are required to assure management and other stakeholders that work quality and environmental standards are being met, and to allow timely corrective action when they are not.

11.2 Performance monitoring and audit

- a) All plantation operations must be audited for work quality and conformity with specifications.
- b) Auditing must be carried out by staff trained in the assessment techniques required and familiar with the prescriptions and quality specifications for the operation.
- c) A written report must be submitted to the manager of the Responsibility Centre summarising the results of the audit.

12. RECORDS AND MANAGEMENT INFORMATION SYSTEMS

Background

Forests NSW is dependent on plantation management information systems for its environmental, operational and business planning, valuation, financial budgeting, estate modelling and yield scheduling.

The main systems are;

GIS - the Geographic Information System, which is a computer database of spatial data, including topographic and cadastral information, and which is used to produce maps and calculate areas. *GIS* also performs other analytical and reporting functions when required.

TFM - The Forest Master plantation database, which stores compartment areas, inventory, cultural records and quality certification data.

Plantation inventory - a range of inventories are carried out during plantation development to produce information on standing volume, growth and tree quality. Most of the information produced is stored in TFM.

PMP - the Preferred Management Priority system, which is a map-based record of management intent for areas of dedicated State Forest. It provides spatial information for harvest and operational planning to ensure that long-term management for particular areas is not compromised.

12.1 Maintenance of management information systems

12.1.1 Area records

a) Once an area is planted, information on boundaries must be entered to the GIS to allow updating of nett planted areas, gross plantation areas and areas of PMP classification. Nett planted compartment areas from GIS must be entered in TFM as soon as they are verified in GIS.

b) GIS must be updated to reflect failed areas or any other losses as soon as accurate information is available. These recalculated areas should also be entered into TFM as soon as they are verified in GIS.

12.1.2 Plantation inventory

Manual TFM a) All plantation inventories prescribed in the Plantation Inventory must be carried out at the specified time, using experienced and trained crews. The information from these inventories should be entered into as soon as possible after inventory.

b) The raw data and summaries from these inventories must be kept in a

secure location to allow further analysis if required, and as a backup to TFM.

12.1.3 TFM

TFM is the primary store of plantation areas, inventory and cultural records and quality certification data. All this information should be entered as soon as possible after capture. Responsibility Centres must have systems in place to ensure that all information is entered expeditiously.

12.1.4 Preferred Management Priority classification

The maps and associated information required for this system must be maintained in accordance with standing instructions. Checks on PMP classification must be part of all operational planning.

12.2 Other records

All reports and other written information relating to a specific plantation area should be stored in an accessible location in the Responsibility Centre. This includes operational reports, audit reports, results of water quality monitoring, pollution incident reports and fire reports.

13. CONSTRUCTION AND MAINTENANCE OF PLANTATION ROADS, TRAILS AND FIREBREAKS

Principles

- *Soil, water catchment, cultural and landscape values should be protected by the careful location, construction, and maintenance of roads and tracks, and regulation of their use.*
- *Planning of road systems will be based on both the economic principle of minimising the combined cost of roading and extraction and on the Principles of Environmental Care.*
- *Road design will be to standards consistent with the purpose for which the road is to be used, and capable of carrying the anticipated traffic with reasonable safety.*
- *Construction and maintenance of roads and associated works will be undertaken in a manner which will ensure compliance with the Principles of Environmental Care.*
- *Roads will be closed in wet conditions when unacceptable damage would occur, or when such other conditions may warrant.*

Forest Practices related to Wood Production in Plantations: National Principles 1.7, 4.1, 4.2, 4.3, 4.4.

Background

A network of suitably located roads of appropriate standard is required to establish, maintain and protect plantations efficiently. Plantation roads must be designed, constructed and maintained such that the environmental and aesthetic values of plantations are protected, consistent with minimising the costs of providing the road system and harvesting the plantation.

Forests NSW' standing instructions (see Appendix 4) give guidance on road design, location, construction and maintenance.

13.1 Road planning, standards and design

13.1.1 Planning for plantation roads

- a) Planning for road access to plantations must be carried out well in advance of construction, and should be based on detailed field inspections and all available site information.
- b) The road network in existing plantations must be examined at the time

of second rotation establishment to determine if it meets current requirements. This examination may lead to closure, relocation, or reconstruction of existing roads.

13.1.2 Road standards

- a) Road standards, in terms of grades and horizontal alignments, widths and pavements, must be sufficient to carry the anticipated volume of traffic with reasonable safety.
- b) The possibilities of staged construction, to allow upgrading at a latter time to meet increased traffic loads, should be explored as a means of reducing early investment.

13.1.3 Road design

Road design should consider;

- the minimisation of total road length and costs consistent with management requirements;
- mitigation measures determined through environmental impact assessment;
- use of topography to minimise earthworks;
- avoiding sensitive areas, particularly drainage protection areas, as far as practicable;
- sediment control and rehabilitation, including catch drains on cut batters, varying batter slopes, topsoiling, revegetation, and engineering structures to intercept and filter turbid runoff;
- prevention of pollution of watercourses and drainage lines by runoff from disturbed soil;
- the facilitation of fire protection and personnel safety during fire fighting, by ensuring adequate access to water supply points, by the elimination of dead end roads, and by providing sufficient turn-around points and passing bays.

13.1.4 Road network density

- a) Road network density should reflect the harvesting and protection needs of the plantation and take into account asset value, fire risk and adequate response time.

As a guide, no area within a plantation shall be further than 200 metres from a road or trail trafficable to a fire suppression vehicle.

- b) For smaller plantation areas, especially isolated areas, the main emphasis should be on providing good boundary access.

13.2 Road construction

- a) All roads and tracks must be surveyed with instruments and marked in the field prior to construction.
- b) Road construction should be scheduled so as to minimise the potential for soil erosion and to allow maximum opportunity for establishment of ground cover.
- c) Construction must be carried out by appropriately trained personnel, using sound engineering practice.
- d) Roads and verges must be progressively drained and verges rehabilitated as necessary during construction to minimise sediment production.

13.3 Road drainage

- a) All roads must be drained, using relief culverts and crowning, or crossfall drainage and rollover structures, depending on road standard and traffic intensity. Spacing of road drainage structures will be dependent on slope and soil erodibility, and should be in accordance with Forests NSW' standing instructions.
- b) Where possible, all crossings of drainage features must be drained so that excessive amounts of road drainage water do not enter directly into drainage feature. Drains must not be constructed closer than 5 metres and further than 40 metres from the drainage feature.
- c) Culverts, mitre drains and rollover drains must be constructed so that they discharge into undisturbed vegetation or suitable filtering structures. Discharge onto fill batters, exposed erodible soils, or directly into drainage features, must be avoided.

13.4 Road maintenance

- a) Roads must be maintained as required to repair damage and restore drainage, and to maintain access for fire protection, but excessive routine grading should be avoided. It may be appropriate in some situations to revegetate roads, and maintain them by slashing.
- b) Appropriate pavement treatments should be considered in sensitive areas to reduce impacts on water quality and to reduce maintenance requirements.
- c) Roads on land owned by State forest must be closed to traffic when conditions are resulting in excessive damage to formations and pavements or sediment production, or if forest operations or natural events make access dangerous.

14. PLANTATION ESTABLISHMENT AND TENDING

Principles

- Plantation establishment methods should be economically and environmentally appropriate for the particular requirements of the species to be planted and the specific site conditions.
- Establishment of plantations may involve the introduction of selected species, provenances or populations to increase productivity or value. However, management of these plantations should aim to constrain or prevent the introduction of these species into surrounding areas.
- Intensive management practices, such as site preparation, fertilising, weed control, pest and disease control and other operations will be carried out in accordance with codes of practice, and be consistent with the Principles of Environmental Care.

Forest Practices related to Wood Production in Plantations: National Principles 5.1, 5.2, 5.3.

Background

The species chosen for planting, the techniques used, and the quality of the work done during plantation establishment and tending, can have a great effect on stand growth, health and stability, and the commercial success of the plantation.

Many of the operations involved in plantation establishment, particularly clearing, cultivation, fertilisation and chemical weed control, also have the potential to impact on environmental values.

14.1 Plantation establishment and tending

14.1.1 *The selection of plantation species and varieties*

- a) The species, variety or provenance chosen should be adapted to the site, be capable of economic propagation and establishment, and be healthy in the long-term. Wherever possible, selection should be done on the basis of local field trials, or successful existing plantations growing in similar climatic and soil conditions.
- b) Where the plantations are being established for commercial reasons, the species and variety chosen should produce wood of a quality and type that will find a ready market at a profitable price.

- c) When available, seed orchard or other genetically superior seedling or cutting material should be used. Adequate records of the type, origin and genetic makeup of the planting stock should be retained.
- d) Plantation species should be selected and managed to minimise the potential of these trees becoming a weed problem in adjoining areas of native vegetation or agricultural land.

14.1.2 Techniques used for plantation establishment and tending

Technical Guidance Notes must be prepared for all plantation establishment and tending operations. These must specify the techniques and quality requirements to be used, on the basis of cost-effectiveness, safety and environmental impact. These Technical Guidance Notes Guidelines must comply with this Code, in particular those chapters dealing with Environmental Protection (Chapters 2 to 4).

14.1.3 Quality monitoring and audit of plantation establishment and tending

Quality monitoring, audit and reporting to the specifications of Technical Guidance Notes must be carried out for all plantation establishment and tending operations.

15. APPLICATION OF AGRICULTURAL CHEMICALS

Principles

- Intensive management practices, such as site preparation, fertilising, weed control, pest and disease control and other operations will be carried out in accordance with codes of practice, and be consistent with the Principles of Environmental Care.
- Use of chemicals, such as herbicides and pesticides and other pest control methods in plantation operations will be in accordance with state policies, procedures and approved usage.

Forest Practices related to Wood Production in Plantations: National Principles 5.3, 7.4.

Background

While fertilisers and pesticides are essential tools in correcting site deficiencies and establishing and protecting plantations, their use must be controlled to prevent harm to workers and the environment.

Where practicable and cost effective integrated pest management techniques should be used to control plantation pests and diseases.

15.1 Application of agricultural chemicals

15.1.1 Choice of chemicals

Managers must take into account the following factors when choosing an agricultural chemical;

- proven effectiveness
- registered or permitted for that use
- minimum human toxicity
- minimum environmental impact
- minimum residual life consistent with achieving the required result
- formulation - granules (water dispersible or dry application) in preference to liquid formulations
- packaging - recyclable or biodegradable packaging preferred

15.1.2 Regulatory requirements

a) Agricultural chemicals must be used in accordance with label directions. Field supervisors must ensure that users (contractors or employees) have read or have had the label directions read to them.

b) Approval from the National Registration Authority must be obtained to

aerial apply pesticides to crops or pests not mentioned on the label, for higher than label rates, or for a non-label application technique (for example, rather than ground, or low volume rather than high volume).

c) Biosolids must only be applied under the authority of a Pollution Control Licence issued by EPA.

with d) Aerial application of fertilisers or pesticides must be in accordance any orders issued by EPA under the Pesticide Act 1978.

e) An application for a Pollution Control Licence must be made to the EPA for any chemical application where the proximity of application may lead to watercourse pollution.

15.1.3 Application of agricultural chemicals

written a) All application of agricultural chemicals must be carried out to a plan prepared by the supervising officer, and approved by the Manager of the Responsibility Centre.

of b) All measuring and mixing of agricultural chemicals, and maintenance equipment, must be in accordance with the *Manual for the Use of Chemicals*.

properly- c) Agricultural chemicals must be applied with well-maintained, calibrated equipment appropriate to the task.

pesticides. d) Water-dispersible granules or suction probes should be used wherever possible to limit exposure and the manual open-pouring of liquid

e) Loading sites must be located so as to minimise the risk of spills reaching drainage lines and watercourses.

f) Herbicide application must comply with the *Guidelines for the Use of Herbicides in or near Water*.

g) Spills must where possible be collected and stored for future use, or disposed of in accordance with the *Manual for the Use of Chemicals*.

h) Aerial application should be in accordance with Forests NSW' *Guidelines for Aerial Application of Spray and Solids to Forests*.

i) Contract agricultural chemical applicators must hold appropriate chemical risk insurance.

in j) Satellite-guided or other approved electronic flightline navigation systems should be used for all aerial application of agricultural chemicals plantations. Human line markers should not be used. The navigation system used should be capable of producing plots of actual flightlines on paper.

k) Ground smoke generators or similar devices should be used for all

is aerial chemical application to indicate prevailing wind direction and strength, and for any other agricultural chemical applications where there is a risk of off-target spray drift.

l) Plans for aerial chemical application must specify allowable meteorological conditions for the operation. Conditions (wind speed, wind direction, air temperature and relative humidity) should be monitored and recorded during the operation, preferably with an on-site recording weather station.

m) Watercourses on aerial application sites must be protected by untreated buffer strips, and water samples should be taken before and after operations to detect contamination. EPA must be notified if any contamination of watercourses is detected.

n) An approved aerial spray drift model (for example FSCBG) should be used in the planning stage of agricultural chemical applications to set boundary and watercourse buffer strip widths.

o) Records of all agricultural chemical application operations should be kept, detailing dates, times, specifications, type and quantity of pesticide used, personnel involved, any problems, results obtained, and weather and flightline information.

p) All handling and storage of agricultural chemicals must be in accordance with Chapter 7 of this Code (*Handling and Storage of Agricultural Chemicals*).

q) Where withholding is a label requirement, treated areas must be closed off and withheld from grazing stock for the relevant withholding period, and signs posted at all entry points to the treated area.

16. CONTROL OF PESTS, WEEDS AND DISEASES

Principles

- Plantations and adjacent native forests should be protected from the adverse effects of fire and from the introduction and spread of plant, insect and animal pests and plant diseases.
- Plantation health surveillance should be undertaken on a regular basis.
- Where weeds, pests or diseases cause significant damage, decline or deaths of trees, prompt specialist advice should be sought to address the problem.
 - Use of chemicals, such as herbicides and pesticides and other pest control methods in plantation operations will be in accordance with state policies, procedures and approved usage.

Forest Practices related to Wood Production in Plantations: National Principles 1.9, 7.2, 7.3, 7.4.

Background

The productivity and commercial success of plantations can be severely affected by pest animals, insects and diseases, and competing weeds.

The invasion of exotic plants into neighbouring areas of remnant native vegetation, may compromise the nature conservation values of such areas. Pine wildlings, along with agricultural plants and weed species, may contribute to the diminution of nature conservation values of these areas.

Plantations may also harbour pest animals and noxious weeds which must be controlled to meet legislative responsibilities, to prevent damage to neighbours, or to protect environmental values.

16.1 Plantation pests, diseases and weeds

16.1.1 *Survey for pests and diseases*

All Forests NSW' plantations, and plantations established under joint venture arrangements, must be regularly surveyed for pests and diseases that could affect tree health and productivity. This survey must be carried out by appropriately qualified specialists.

16.1.2 Control of pests, diseases and weeds

- a) Specialist advice should be sought when formulating control measures for plantation pests, diseases and weeds.
- b) Control programs for pests, diseases and weeds that affect the productivity of plantations should be based on economic criteria.
- c) Additional control measures may be required for pests and weeds that affect environmental values.
- d) Where the invasion of pine wildlings from Forests NSW' plantations threaten to compromise nature conservation values of remnant vegetation on neighbouring land or within the plantation, Forests NSW should co-operate with relevant authorities and landholders to control the spread of these wildlings.

Factors to be taken into account in assessing the impact of the spread of wildlings include:

- the conservation value of the remnant vegetation;
- the impact of the invasion of other exotic species and the commitment of the adjoining landholders and authorities to controlling the impact.

16.2 Noxious weeds and pest animals

- a) Where declared noxious weeds or pest animals occur on State Forest plantations, Forests NSW must co-operate with relevant authorities and affected neighbours, and control these weeds and pests to the extent necessary to prevent them spreading or damaging other land.
- b) Where Forests NSW has entered joint venture agreements, the landowner is responsible for control of declared noxious weeds and pest animals, apart from any control necessary for the establishment of the plantation.

16.3 Control programs

- a) All use of pesticides for control of pests, weeds and diseases must comply with the Pesticides Act, the Commonwealth Agricultural and Veterinary Chemical Code Act, and the requirements of Chapters 6, 7 and 15 of this Code.
- b) Control measures must be subject to environmental impact assessment in accordance with the Environmental Planning and Assessment Act.

17. FIRE PROTECTION

Principles

- Plantations and adjacent native forests should be protected from the adverse effects of fire....
- Fire protection planning should be undertaken on a regional basis in co-ordination with relevant land management agencies and with local bushfire control organisations.

Forest Practices related to Wood Production in Plantations: National Principles 1.9 (Part), 7.1

Background

Forests NSW, in common with other land managers in NSW, is obliged by the Bush Fires Act to take all practicable steps to prevent the occurrence of fires on, and to minimise the danger of spread of fires from, land under its management.

Wildfire which destroys or damages plantation forests will have a significant economic impact on the forest owner and dependent industry. Wildfire, fire fighting and hazard mitigation activities such as fuel reduction burning and fire break construction, may also have significant environmental effects.

The susceptibility of plantations to wildfire depends on the species, age and location. The main plantation species in NSW, radiata pine, is susceptible to damage at all ages, and grows in locations where dangerous fire weather can be expected many times in a rotation. Other exotic and native tree species grown by Forests NSW in plantations are also susceptible to damage from wildfire, to a greater or lesser extent.

17.1 Fire safety

17.1.1 Fire training

All employees and where appropriate, contractors and their employees, must be trained and accredited to at least Level 1 Fire-fighter.

17.1.2 Protective clothing and equipment

All employees and contractors and their employees required to fight fires or carry out hazard reduction or site preparation burning must have access to approved fire-fighting protective clothing.

The minimum requirement will be:

- Safety helmet or cap
- Overalls
- Heavy-duty lace-up boots
- Leather gloves
- Goggles
- Smoke mask

17.2 Plantation fire protection

17.2.1 Reducing fire risk from outside the plantation

Plantation managers should consider the ambient fire risk for the areas, and where appropriate reduce the risk of fire entering from outside the plantation by the following techniques;

- hazard reduction burning and fire trail construction in adjoining and other nearby land;
- maintenance of strategic external access roads and trails outside the plantation to a depth of up to 20 kms;
- construction and maintenance of cleared fire breaks;
- the development of co-operative fire fighting and hazard management arrangements with neighbours.

17.2.2 Reducing fire risk within the plantation

Plantation managers must ensure that all employees and contractors comply with the clauses of the Forestry Regulation relating to fire prevention, and also the following requirements;

a) Fuel storage and refuelling

(i) all fuel storage must comply with AS 1940 - 1993.

(ii) bulk fuel storage units with a capacity of over 200 litres must at all times, other than “in transport”, be located on an area cleared of flammable material or vegetation for a distance of not less than 4.5 metres around the unit. Such units must be capable of immediate removal from the site in an emergency, free from leaks and accumulated debris.

(iii) fuel and oil containers of capacity equal or less than 25 litres must be of a standard approved by the Supervising Forest Officer and comply with AS 2906. Such containers must be located only in an area cleared of flammable material or vegetation for a distance of not less than 1.5 metres around the container.

(iv) machines must be refuelled where the ground is clear of all flammable material and vegetation for a distance of not less than 1.5 metres in all directions from the extremities of the machine.

b) Use of welding, oxy-acetylene and other equipment

(i) Welding or the use of oxy-acetylene equipment or angle grinders must

be carried out only on machinery positioned on ground which had been cleared of flammable material of vegetation for a minimum of 1.5 metres from the operations.

(ii) The use of welders, oxy-acetylene equipment or angle grinders is prohibited on days of Total Fire Ban. Managers should also stand down other plant and equipment likely to start fires in plantations on days of Total Fire Ban, e.g. chainsaws, chopper-rollers and slashers.

c) Smoking in plantations

Smoking is only allowed on roadways cleared of flammable material. Smoking is not permitted in the open on days of Total Fire Ban.

17.2.3 Other actions to reduce fire risk

Plantation managers must consider other actions to reduce risk for both conifer and eucalypt plantations including:

- avoiding large accumulations of residual debris resulting from establishment operations;
- hazard reduction burning under some pine and eucalypt plantations;
- hazard reduction within retained and remnant areas of native vegetation;
- retention of in-compartment four wheel drive access tracks where present;
- regular routine road, trail and firebreak maintenance;
- silvicultural treatment to create fuel-reduced zones along strategic roads and boundaries in the plantation;
- promoting grazing activity within the plantation;
- use of appropriate detection and standby arrangements;
- maintenance of adequate fire fighting resources;
- provision and maintenance of dams and other watering points; and,
- any other measures decided on a Regional basis.

17.3 Co-operative fire fighting arrangements

Forests NSW will be an active member of District Bush Fire Management Committees, and will participate fully in planning, hazard reduction and co-operative fire fighting arrangements, in accordance with the Bush Fires Act.

17.4 Planning for fuel management and site preparation burning

a) All hazard reduction and site preparation burning must be subject to environmental impact assessment in accordance with the Environmental Planning and Assessment Act.

b) Hazard reduction and site preparation burning must comply with orders prohibiting burning issued by EPA.

c) Hazard reduction burning must be in accordance with prescriptions relating to preservation of critical weight range species.

d) Annual hazard reduction plans must be submitted to the District Bush Fire Management Committee for endorsement.

e) The intensity of hazard reduction burning in plantation drainage protection areas must be minimised. Protection areas must not be intentionally burnt in the first two years after establishment of the plantation.

17.5 Post-fire inspections and erosion mitigation

Inspections must be carried out in all areas affected by wildfire, fire fighting or hazard reduction operations to identify and remove hazards (for example unstable trees and hang-ups). Remedial work must be carried out as required to minimise pollution hazards.

APPENDIX 1

Forest Practices Related to Wood Production in Plantations: National Principles

(Prepared by the Forest Management and Co-ordination Committee of the Standing Committee on Forestry, for the Ministerial Council of Forestry, Fisheries and Aquaculture, endorsed November 1995, published March 1996. Reproduced with permission.)

1. Principles of environmental care

- 1.1 Native forest should not be cleared for plantation establishment where this would compromise regional conservation and catchment management objectives. In some circumstances it may be appropriate to clear forests that have been severely degraded by impacts such as disease, weed invasion, wind and fire so as to enable rehabilitation through replanting.
- 1.2 Values such as intensive recreation, high scenic quality, significant geomorphic, biological or cultural heritage sites should be recognised in the planning of plantation forest operations.
- 1.3 Plantation management should comply with state and regional conservation and catchment management objectives, relevant planning schemes and legislation.
- 1.4 Water quality (physical, chemical or biological) should be protected by measures controlling change resulting from plantation activities.
- 1.5 Water yield should be managed as required by careful planning of operations.
- 1.6 Soil stability should be protected by measures which regulate site disturbance.
- 1.7 Soil, water catchment, cultural and landscape values should be protected by the careful location, construction and maintenance of roads and tracks and regulation of their use.
- 1.8 Fauna, floristic and landscape values should be protected by the careful planning of plantation layout establishment operations and the reservation and protection of appropriate areas of native vegetation - such values should be recognised in subsequent plantation management.
- 1.9 Plantations and adjacent native forests should be protected from the adverse effects of fire and from the introduction and spread of plant, insect and animal pests and plant diseases.
- 1.10 Operators will be trained in the principles of environmental care.

2. Safety

- 2.1 All plantation establishment, management and utilisation activities will be conducted to comply with relevant occupational health and safety legislation and policy. In particular, all operators should be trained to designated standards in the safe and efficient use of equipment and machinery, and be responsible for safe working practices.

3. Planning

- 3.1 State and local governments should, with appropriate public involvement, pursue planning policies that provide secure zoning for commercial planting with the objective that tree planting and subsequent harvesting for commercial wood production should be an 'as of right' use.
- 3.2 State governments will establish a sound legal basis for separating the forest asset component from the land assets for tree plantings. The Commonwealth Government will consider similar action regarding taxation, capital evaluation etc.
- 3.3 Plantation strategic planning should be developed in conjunction with regional development plans.
- 3.4 The environmental, social and economic effects of all plantation operations envisaged for an area will be considered during the planning process.
- 3.5 Individual plantation operations will be conducted in accordance with relevant codes of practice.

4. Access

- 4.1 Planning of road systems in plantations will be based on both the economic principle of minimising the combined cost of roading and extraction and on the Principles of Environmental Care.
- 4.2 Road design will be to standards consistent with the purpose for which the road is to be used, and capable of carrying the anticipated traffic with reasonable safety.
- 4.3 Construction and maintenance of roads and associated works will be undertaken in a manner which will ensure compliance with the Principles of Environmental Care.
- 4.4 Roads will be closed in wet conditions when unacceptable damage would occur or when such other conditions may warrant.

5. Establishment and maintenance

- 5.1 Plantation establishment methods should be economically and environmentally appropriate for the particular requirements of the species to be planted and the specific site conditions.
- 5.2 Establishment of plantations may involve the introduction of selected

species, provenances or populations to increase productivity or value. However, management of these plantations should aim to constrain or prevent the introduction of these species into surrounding areas.

- 5.3 Intensive management practices, such as site preparation, fertilising, weed control, pest and disease control and other operations will be carried out in accordance with codes of practice, and be consistent with the Principles of Environmental Care.

6. Timber harvesting

- 6.1 Timber harvesting will be planned and carried out under codes of practice to meet the Principles of Environmental Care.

6.2 The harvesting plan will consider factors such as harvesting unit size, and location of harvesting units; design and location of landings and snig tracks; harvesting equipment; areas excluded from logging; and areas specified for protection and reforestation.

- 6.3 Harvesting operations should not be conducted in a manner which compromises the Principles of Environmental Care, or where the safety of workers is at unacceptable risk.

6.4 Soil and water values should be protected by progressive rehabilitation and drainage of snig tracks, temporary roads, log dumps and any other earthworks associated with harvesting operations.

7. Forest protection

- 7.1 Fire protection planning should be undertaken on a regional basis in co-ordination with relevant land management agencies and with local bushfire control organisations.

7.2 Plantation health surveillance should be undertaken on a regular basis.

7.3 Where weeds, pests or diseases cause significant damage, decline or deaths of trees, prompt specialist advice should be sought to address the problem.

7.4 Use of chemicals, such as herbicides and pesticides and other pest control methods in plantation operations will be in accordance with state policies, procedures and approved usage.

8. Monitoring and review

8.1 Where practicable, plantation operations should be supervised and monitored by qualified persons and be subject to audit.

8.2 The National Principles should be reviewed and evaluated after three years.

APPENDIX 2

Legislation applying to plantation establishment and maintenance

A. NSW Legislation

1. *Forestry Act 1916*

(Administered by **Forests NSW of New South Wales**).

The Forestry Act 1916 is the principal legislation governing the operations of Forests NSW. The Forestry Act gives Forests NSW power to control and manage forestry areas, to acquire land, to establish and maintain plantations, seed orchards and tree nurseries, to engage employees, to control the use of fire, and to regulate and control the use of roads.

The Act also allows Forests NSW to enter agreements and form partnerships with other parties, including local government and other public authorities, to undertake forestry on areas other than Crown-timber lands.

The Act requires Forests NSW:-

“to preserve and improve, in accordance with good forestry practice, the soil resources and water catchment capabilities of Crown-timber lands”

and to take;

“all practicable steps it considers necessary or desirable” to preserve and enhance the environment.

The Act authorises designated forest officers to control the activities of all persons, contractors, licensees and the public, including the use of vehicles and machinery, on Forests NSW. Authorised forest officers may also issue penalty or infringement notices for specified offences against the Forestry Act.

2. *Bush Fires Act 1949*

(Administered by the **Department of Bush Fire Services**)

The Bush Fires Act provides for the prevention, control and suppression of bush fires, and for the mitigation of danger resulting from fires. The Act contains provisions for the control and suppression of fires that are imminent or burning, including a definition of the responsibilities of various authorities during bush fire emergencies. Importantly, it also ensures that measures to reduce the hazards that contribute to both the occurrence, intensity and spread of fire are carried out by responsible agencies such as Forests NSW.

Section 41 provides for the preparation of District Bush Fire Management Plans. These comprise:-

- an Operational Plan which sets out the procedures to be followed in determining levels of preparedness during the bush fire season, procedures to be followed for the

control and suppression of bush fires, and;

- a Fuel Management Plan that sets out strategies and programmes for the reduction of fire hazards.

The Act also prescribes penalties for various offences.

3. *Clean Air Act 1961*
(Administered by the NSW **Environment Protection Authority, EPA**)

Air pollution is defined by this Act as “the emission into the air of any air impurity.”

The EPA may prohibit open burning in any area of the State if it believes that open burning is likely to contribute to unacceptable air pollution. Such orders may be published in newspapers or broadcast, and have effect for periods up to 7 days.

Officers authorised under this Act may direct that fires burning in contravention of an order by EPA be extinguished immediately

4. *Clean Waters Act 1970*
(Administered by the NSW **Environment Protection Authority, EPA**)

This Act prohibits the pollution of any waters, except under authority of a License issued by the EPA. Pollution is defined to include “placing in or on or any other way introducing into or onto waters any matter which changes the physical, chemical or biological conditions of the waters.” Waters include “any river, stream, lake, lagoon, swamp, wetlands, unconfined surface water, natural or artificial water courses, dam or tidal waters including the sea.”

Pollution is deemed to have been caused if polluting material is placed into, or in a position where it is likely to fall, descend, wash, be blown or percolate into any waters, or onto the dry bed of any waters, drain, channel or gutter.

The Act provides for the classification of waters. Schedule 2 of the Regulation prescribes maximum concentrations for various substances, including herbicides, in classified waters.

Offences and penalties are prescribed by the Environmental Offences and Penalties Act 1989. An offence is committed even if an action unintentionally results in water pollution.

5. *Construction Safety Act 1912*
(Administered by the **WorkCover Authority**)

The Construction Safety Act provides for the accrediting and licensing of operators of cranes, forklifts, front-end loaders and backhoes.

6. *Dangerous Goods Act 1975*
(Administered by the **WorkCover Authority**)

The Dangerous Goods Act provides for the classification of Dangerous Goods and through the Dangerous Goods Regulation 1978 regulates their transport and storage. Dangerous Goods include flammable and combustible liquids and some pesticides.

7. ***Dividing Fences Act 1991***
(Administered by **Local Government**)

The Dividing Fences Act provides for the fair apportionment of the cost of dividing fences between the owners of adjacent properties. The Act does not override any covenants made between property owners which apportion costs. Although the Act does not bind the Crown, Forests NSW may enter into agreements with adjacent landholders to assist in the fencing of dedicated forest boundaries.

8. ***Environmental Planning and Assessment Act 1979***
(Administered by the **Department of Urban Affairs and Planning**)

Some objectives of the Environmental Planning and Assessment Act are to encourage:-

"the proper management, development and conservation of natural and man made resources, including agricultural land, natural areas, forests for the purpose of promoting the social and economic welfare of the community and a better environment" and;

"protection of the environment."

The Act promotes the sharing of responsibility for environmental planning between the different levels of government in the State, and encourages public participation.

Forests NSW operates under Part 5 of the E.P.&A. Act, and where necessary prepares environmental impact assessments and Environmental Impact Statements (EISs), which may include Species Impact Statements (SISs).

Plantation forestry on private land may require consent from Local Government under Part 4 of the Act, depending on the provisions of the Local and Regional Environmental Plans and State Environmental Planning Policies.

The Act provides for the proclamation of State Environmental Planning Policies, including:-

S.E.P.P. No. 44, which regulates the destruction of potential koala habitat
S.E.P.P. No. 46, which regulates the clearing of native vegetation on private lands.

9. ***Environmentally Hazardous Chemicals Act 1985***
(Administered by the NSW **Environment Protection Authority, EPA**)

Under this Act an inventory of chemicals that can be used in NSW has been created. It is an offence to use, manufacture, sell or receive any chemical that is not on the inventory. The Act has provided for pesticide wastes, including used pesticide containers, to be declared as chemical wastes, subject to chemical control orders made by EPA. The Act also provides for the control of activities that contaminate land, and for the removal of contaminants from land.

10. Environmental Offences and Penalties Act 1989
(Administered by the NSW **Environment Protection Authority, EPA**)

This Act creates offences for contravention of other laws relating to pollution and for environmental harm arising from unlawful waste disposal and for allowing substances to leak or spill. It enables any person to seek restraining orders in court to stop breaches or anticipated breaches of pollution laws. It details the penalties and enforcement procedures for breaching pollution control statutes, and extends personal liability for pollution offences to individuals as well as corporations.

The Act enables courts to make polluters pay for clean-up, and creates three tiers of offences, with varying levels of penalty (see Background below).

Background

The following pollution control legislation is applicable to Forests NSW' establishment and maintenance operations;

Clean Air Act 1961 (air pollution)
Clean Waters Act 1970 (water pollution)
Noise Control Act 1975 (noise pollution)
Pollution Control Act 1970 (licensing of activities causing pollution)
Environmental Offences and Penalties Act 1989 (unauthorised or negligent disposal of waste, leaks or spills of harmful substances, and penalties for offences under the above Acts)

The Environmental Offences and Penalties Act 1989 prescribes penalties under the following categories;

Tier 1 offences - Unauthorised or negligent disposal of waste, allowing substances to leak or spill, or emission of ozone-depleting substances.

For Tier 1 offences it is a defence to prove that the commission of the offence was due to causes over which the person responsible had no control, and that the person exercised due diligence to prevent the commission of the offence.

Tier 2 offences - Offences against Clean Air Act 1961, Clean Waters Act 1970, Noise Control Act 1975 or Pollution Control Act 1970, and littering offences previously in the Local Government Act.

Tier 3 offences - Schedule 2 of the Act lists tier three offences which are minor offences that are dealt with by imposition of penalty notices for amounts up to \$600, including that of littering in a public place, for which Penalty Notices may be issued by authorised officers. Authorised Forest Officers can issue penalty or infringement notices under this division for littering on Forests NSW, timber reserves and flora reserves.

11. Fertilisers Act 1985
(Administered by the NSW **Environment Protection Authority, EPA**)

This Act provides for the registration of brand names of chemical, manufactured and liming materials, and the regulation of their sale. It includes provisions relating to sewage sludge and soil improving agents.

12. Fisheries Management Act 1994
(Administered by the **Minister for Agriculture and Fisheries**)

Sections 218 to 220 of this Act refer to obstructions to fish passage. Section 218 gives the Minister authority to require the construction of works (other than public authority works) that enable fish to pass through or over dams, weirs or reservoirs. These Sections of the Act need to be considered when constructing bridges, culverts or other watercourse crossings for forest roads and trails.

13. Heritage Act 1977
(Administered by the **Heritage Council, and Local Government**)

This Act provides for the making of emergency, interim and permanent Conservation Orders to protect buildings, relics, works or places of scientific, natural and aesthetic significance for the State. It can include protection for the natural environment as well as the built environment.

Forests NSW is required by Section 170 to maintain a Heritage Conservation Register. There is also an obligation under this Act to notify the Heritage Council of the discovery or existence of a relic.

14. National Parks and Wildlife Act 1974
(Administered by the **National Parks and Wildlife Service, NPWS**)

Aboriginal relics

All aboriginal relics are the property of the Crown. It is an offence to disturb aboriginal relics or declared aboriginal places without the consent of the Director-General NPWS. Relics may not be disturbed, moved or removed from Crown land. Any relic discovered must be reported to the Director-General NPWS.

Native Animals

The Act classifies fauna as “unprotected” (Schedule 11), “endangered” (Schedule 12) or protected amphibians (Schedule 12A). Any species not listed under these schedules is automatically “protected.” Protected fauna may not be harmed except according to the conditions of a license issued by the NPWS, or during declared open seasons. Open seasons do not apply in National Parks. They may apply on Forests NSW, with the approval of Forests NSW. Unprotected fauna may be taken or killed at any time, but on State forest only in accordance with relevant regulations.

The Minister or Director-General of NPWS may issue stop work orders to prevent activity that they believe may significantly affect the environment of protected fauna. If satisfactory modifications cannot be made to the proposed activity to protect the environment of protected fauna, an interim protection order may be made.

Threatened species

Consent authorities (Part 4 of the E.P.&A. Act) and determining authorities (under Part 5 of the E.P.&A. Act) are required to consider the likely impact of proposed activities on threatened species, populations, ecological communities, or their critical habitats, and on any other protected fauna or flora. This process may require the preparation of a Species Impact Statement.

Protected native plants

The Act provides for the classification of some native plants as “protected”. No one may pick or remove protected native plants on State forest or other Crown land unless they have a license issued by Forests NSW or where appropriate NPWS. Protected plants on private property may be picked and removed with the permission of the owner, lessee or occupier of that property.

15. *Noise Control Act 1975* (Administered by the NSW **Environment Protection Authority, EPA,** and **Local Government**)

The Act lists “scheduled premises” and equipment that is regulated by EPA. Other sources of community noise are controlled by local councils. The Act prescribes acceptable levels for some sources of noise, but where none is prescribed, “offensive noise” is prohibited.

16. *Noxious Weeds Act 1993* (Administered by the **Minister for Agriculture and Fisheries**)

The Noxious Weeds Act provides for the categorisation of noxious weeds and specifies the extent of control required for each category by private and public landholders. Order No. 7 of 19.5.95 made under this Act lists all noxious weeds and their categories. The Act requires Forests NSW and other public authorities to control noxious weeds on their land, to the extent necessary to prevent the weeds spreading to other land. The Minister may serve a weed control notice on Forests NSW, on recommendation from a local weed control authority.

17. *Occupational Health and Safety Act 1983* (Administered by **WorkCover NSW**)

All employees and contractors who work in the forest shall comply with the provisions of the O.H.&S. Act. Forests NSW has a special duty, under Sections 15, 16(1) and 17(1) of this Act, to make certain that all forest workers have as safe a work environment as is practical, use safe equipment and adhere to safe working practices. Forests NSW must ensure that employees, contractors and the visiting public are not exposed to risks to their health or safety in the forest environs as a result of actions by Forests NSW’ employees or its’ contractors.

The Occupational Health and Safety (Hazardous Substances) Regulation 1996 lists hazardous substances (defined broadly to include any substance with the potential to harm the health of workers), and provides for proper labelling, supply of MSDS, training, risk assessment and control measures, and monitoring and health checks, for any hazardous substances used in the workplace. Employers must keep a register of all hazardous substances used and produced in the workplace, and records of worker

training, risk assessment reports and the results of monitoring.

18. *Pesticides Act 1978*

(Administered by the NSW **Environment Protection Authority, EPA**)

The Pesticides Act controls the possession and use of pesticides, and regulates the use of aircraft for the application of pesticides and fertilisers. It is an offence to use a pesticide in a way likely to cause a risk of injury to anyone or damage to the property of another.

Pesticides must be used in strict accordance with label directions, and persons are required to read label directions before using, keeping or disposing of any pesticide. A permit must be obtained from the National Registration Authority, or in some cases EPA, for the possession and use of an unregistered pesticide, or use of a pesticide in a manner not in accordance with label directions.

All aerial pesticide applicators must operate under an aircraft (pesticide) applicator license, and pilots must hold a pilot (pesticide rating) license. EPA may further regulate by order the aerial applications of pesticides and fertilisers, by specifying aircraft and equipment type, rates allowed to be applied, climatic conditions and restrictions on where pesticides and fertilisers can be applied. Under Pesticides Order Air-1, the aerial application of pesticides is prohibited within 150 metres horizontally from the boundary of any dwelling, school premises, factory premises or other public place.

(See also *B. Commonwealth legislation*, Agricultural and Veterinary Chemicals Act 1994 and the Agricultural Chemicals Code Act 1994.)

19. *Pollution Control Act 1970*

(Administered by the NSW **Environment Protection Authority, EPA**)

This Act provides for the licensing of activities causing pollution that would otherwise be an offence under the Clean Air Act 1961, Clean Waters Act 1970 and the Noise Control Act 1975.

Pollution Control Licenses are issued with conditions. If the holder of a Pollution Control License contravenes any condition of the license that person is guilty of an offence under the Environmental Offences and Penalties Act 1989.

20. *Rural Lands Protection Act 1989*

This Act provides for the establishment and management of travelling stock reserves and Rural Lands Protection Boards, which are responsible for the suppression and destruction of noxious animals (including wild dogs) and insect pests.

21. *Soil Conservation Act 1938*

(Administered by the **Department of Land and Water Conservation, DLWC**)

The Soil Conservation Act regulates clearing on certain categories of “protected land”. The protected land provisions of the Act do not apply to State Forest plantations. However Forests NSW complies with agreed best management practice within State Forest plantations through the use of environmental protection guidelines

such as the SEMGL 1993.

22. Surveyors Act 1929, Survey Co-ordination Act 1949
(Administered by the **Department of Land and Water Conservation**)

These Acts provide that no unauthorised person may deface or interfere with any survey mark, e.g. survey peg, shield tree, or trigonometric marker.

23. Threatened Species Conservation Act 1995
(Administered by the **National Parks and Wildlife Service, NPWS**)

This Act makes it an offence to harm or pick a threatened species, population or ecological community of a plant or animal, or damage a critical habitat or other habitat of a threatened species, except under authority of a license issued by NPWS or in the course of an activity that has satisfied the requirements of the E.P.&A. Act 1979.

24. Timber Plantations (Harvest Guarantee) Act 1995
(Administered by the **Department of Urban Affairs and Planning**)

This legislation provides for the accreditation of timber plantations established in compliance with the E.P.&A. Act and SEPP 46. In accredited plantations harvesting operations (including routine silvicultural and maintenance activities) are not subject to Parts 4 and 5 of the E.P.&A. Act, and to certain provisions of the National Parks, Heritage and Local Government Acts, provided that harvesting is in accordance with an approved plantation (environment protection) harvesting code.

25. Traffic Act 1909, Roads Act 1993, Motor Accidents Act 1988, Local Government Act 1993.
(Administered by the **Roads and Traffic Authority**, and local government)

Registration of vehicles and licensing of drivers

All motorised vehicles operating on State forest plantations must be registered within the provisions of the Motor Traffic Act and comply with the provisions set out in the Regulation to the Roads Act 1993. All drivers must hold a current Driver's License appropriate to the class of vehicle being driven.

Load limits

All motor vehicles must comply with load limits for vehicles operating on public roads and streets, as determined for main roads and highways by the Roads and Traffic Authority (RTA), and other public roads by local government.

Permits for unregistered vehicles

Other motorised vehicular plant (where applicable) must be issued with a "**Permit to operate an unregistered motor vehicle**" issued by the Roads and Traffic Authority. This permit is needed for such machines as crawler-tractors, excavators, forwarders, skidders, loading cranes and agricultural tractors modified and used in plantation establishment and maintenance operations.

Third party injury insurance

For the purposes of the Traffic Act and the Motor Accidents Act, all areas within State forest are deemed to be public streets. Hence operators of vehicles and machines on Forests NSW that comply with registration or permit requirements are covered by third party insurance for personal injury.

26. *Workers Compensation Act 1987*
(Administered by **WorkCover NSW**)

The Workers Compensation Act provides for workers compensation insurance and the rehabilitation of injured workers.

B. Commonwealth legislation

27. *Agricultural and Veterinary Chemicals Act 1994, Agricultural and Veterinary Chemicals Code Act 1994*
(Administered by the **National Registration Authority, NRA**)

This legislation provides for the application of uniform national standards to the registration and use of agricultural and veterinary chemicals. The NRA is responsible for registration and extended uses, while state authorities (in NSW the EPA), are responsible for control and any restrictions on use.

APPENDIX 3

Australian Standards and Codes of Practice applying to plantation establishment and maintenance

Australian Standards

- AS 1121 - 1983 *Guards for agricultural tractor PTO drives*
- AS 1216 - 1981-84 *Classification, Hazard Identification and Information Systems for Dangerous Goods*
- AS 1319 - 1993 *Safety Signs for the Occupational Environment*
- AS 1636.1 - 1996 *Tractors - Roll-over Protective Structures - Criteria and Tests. Part 1: Conventional tractors*
- AS 1636.2 - 1996 *Tractors - Roll-over Protective Structures - Criteria and Tests. Part 2: Rear-mounted for narrow-track tractors*
- AS 1678.10.001-1985 *Emergency Procedure Guide Transport - Pesticides*
- AS 1716 - 1991 *Respiratory Protective Devices*
- AS 1800 - 1981 *The Selection, Care and Use of Industrial Safety Helmets*
- AS 1841 - 1992 *Portable Fire Extinguishers (Parts 1 - 5, Water & powder types and servicing)*
- AS 1940 - 1993 *The Storage and Handling of Flammable and Combustible Liquids*
- AS 2153 - 1978 *Guarding of Agricultural Tractors and Machinery*
- AS 2187.1- 1984 *SAA Explosives Code Part 1: Storage and Land Transport*
- AS 2188 - 1988 *Explosives - Relocatable Magazines for Storage*
- AS 2294 - 1990 *Earthmoving Machinery - Protective Structures*
- AS 2507 - 1984 *The Storage and Handling of Pesticides*
- AS 2508.10.001-1986 *Safe Storage and Handling Information Card - Pesticides*
- AS 2727 - 1984 *Chainsaws - Guide to Safe Working Practices*
- AS 2906 - 1991 *Fuel Containers - Portable - Plastics and Metal*
- AS 3574 - 1988 *SAA Forest Safety Code*

Australian Standards are available from Standards Australia
Phone 02 9746 4666 Fax 02 9746 3333

Codes of Practice and other External Guidelines

Australian Dangerous Goods (ADG) Code (5th ed.).
Australian Government Publishing Service 1992

“Is an EIS required” - Best Practice Guidelines for Part 5 of the Environmental Planning and Assessment Act 1979
NSW Dept. of Urban Affairs & Planning 1995

Classification of Dangerous Goods.
NSW WorkCover Authority 1995

Control of Workplace Hazardous Substances National Code of Practice (Control Code of Practice).
Worksafe Australia 1994

Code of Practice for the Use and Storage of Chemicals in Agricultural Workplaces.
NSW WorkCover Authority 1996

Disposal of Surplus Pesticide Containers, Sprays and Spills - Commercial Users Guide.
Environmental Protection Authority 1996

Environmental Guidelines for Use and Disposal of Biosolid Materials.
Environment Protection Authority 1996

Erosion and Sediment Control Strategy for Forest Operations.
Dept. of Land and Water Conservation 1995

Guidance Note for the Assessment of Health Risks Arising from the Use of Hazardous Substances in the Workplace.
Worksafe Australia 1994

Guidelines for the Use of Herbicides in or near Water.
Australian Gov. Publishing Service 1985

List of Designated Hazardous Substances.
Worksafe Australia 1994

National Standard and Code of Practice for Manual Handling.
Worksafe Australia 1990

Standard Erosion Mitigation Guidelines for Logging in NSW (SEMGL).
Department of. Land and Water Conservation 1993

Storing Pesticides Safely on the Farm.
NSW WorkCover Authority

Unsealed Roads Manual Guidelines to Good Practice.
Australian Road Research Board Ltd, 1993

APPENDIX 4

Current State Forest policies and other instructions relevant to plantation establishment and maintenance

Policies

<i>Forest Health Policy No. 21.</i>	Approved 19 April 1991
<i>Fire Management Policy Statement</i>	Approved 22 November 1995
<i>Forests NSW Corporate Plan 1995/96 to 1998/99</i>	Issued April 1995.

Circulars

<i>EPA - No Burn Notices. OC95/12.</i>	Issued 24 August 1995
<i>Preferred Management Priority Classification C1100.</i>	Issued 30 August 1993

Manuals and other instructions

<i>Manual for the Use of Chemicals (2nd Ed)</i>	Issued June 1996
<i>Erosion and Sediment Control Strategy for Eucalypt Plantation establishment on the North Coast of NSW</i> DLWC and SFNSW	2nd Edition June 1996
<i>Eucalypt Joint Venture Program - Plantation Officer's Manual</i>	Issued July 1996
<i>Safety Standards Manual</i>	Issued March 1995

Instructions associated with forest plantation roading

<i>Australian Rainfall & Runoff A Guide to Flood Estimation</i> Pilgrim, D. H. (ed.) Institute of Engineers 1987	<i>The Geometric Design of Forest Roads</i> FC NSW, 1991
<i>Glossary of Technical Terms Associated with Forest Roading</i> Operational Circular 96/4 SFNSW	<i>Standard Erosion Mitigation Guidelines for logging in NSW (SEMGL)</i> DLWC 1993
	<i>Unsealed Roads Manual - Guidelines to Good Practice</i> Aust. Road Research Board Ltd, 1993

GLOSSARY

Accreditation

Formal documentary evidence of competence to perform a particular task, following training and testing.

Agricultural chemical

Fertilisers, pesticides and biosolids.

Australian Code for the Transport of Dangerous Goods by Road and Rail (ADG Code)

The Code prepared by the National Standing Advisory Committee on the Transport of Goods and endorsed by the Australian Transport Advisory Council. The ADG Code covers the classification, packaging, marking and transport of dangerous goods.

Australian Standard (AS)

A standard published by Standards Australia, formerly the Standards Association of Australia.

Batter

An earth slope formed during road construction either by the placing of fill material (fill batter) or by cutting into the natural hillside (cut batter).

Batter stabilisation

The provision of adequate vegetative, structural or mechanical measures to control erosion from road batters. Measures include provision of catch drains, topsoiling, seeding or mulching.

Biosolid

Solid organic waste material which may be applied to a plantation as a soil amendment. Includes sewage sludge and pulpmill waste.

Bridge

A structure designed to carry a road over a drainage feature by spanning it.

Causeway

A natural or constructed crossing that enables vehicles to ford a watercourse, drainage line or drainage depression. The pavement may be of concrete, gravel, bitumen, rock, logs or natural surface.

Chemical

Any element, compound or complex present as an entity or contained in a mixture.

Classification (dangerous goods and hazardous substances)

The process whereby the toxicological, physico-chemical and ecotoxicological properties of a substance are identified and categorised.

Combustible liquid

Any liquid, other than a flammable liquid, that has a flash-point, and that has a firepoint less than its boiling point, as defined by the ADG Code.

Combustible

A substance that is capable of burning.

Container (dangerous goods and hazardous substances)

Anything in or by which hazardous or other substances are or have been wholly (or partly) cased, covered, enclosed, contained or packed, whether such a container is empty, or partially or completely full.

Contractor

Any person who contracts to carry out work for Forests NSW.

Control measures (dangerous goods and hazardous substances)

Methods which can be used to reduce the risks to health and safety from work with hazardous substances.

Critical weight range species

Small to medium sized (0.2 - 5 kg) native mammals whose long-term survival is threatened by predation or competition from feral carnivores.

Crossbank

A hump of earth constructed across a track or road to baulk the flow of water so that it can be diverted effectively.

Crossfall drainage

Drainage which occurs when the surface of a road, trail or other access-way has sufficient cross slope to cause water to flow across and off the surface, rather than along it. Where the water flows into the hillside it is termed *Infall*, and where flow is away from the hillside so that all water drains to the lower terrain side of the road it is termed *Outfall*. where the road surface is convex in shape causing water to flow away from the road centre to both edges it is termed *Crowning*.

Crossing

Any structure, including bridges, causeways, and culverts, designed to allow the crossing of a drainage feature.

Crowning (see also crossfall drainage)

Shaping of a road formation so that water drains to both sides of the road.

Culvert

One or more enclosed conduits for conveying a drainage feature underneath a road formation.

Dangerous goods class

The class allocated to a substance under the ADG Code.

Dangerous goods

Substances which are either specifically listed in the ADG Code or meet the classification criteria of the ADG Code.

Drainage depression

A level to gently inclined shallow, open depression with a smoothly concave cross-section, rising to moderately inclined hillslopes, that conveys runoff only during or immediately after (i.e. hours after) periods of heavy rainfall.

Drainage depressions may be subject to seasonal waterlogging and spring activity, and vegetation type may indicate a wetter micro-environment than the surrounding country.

Drainage feature

A drainage depression, drainage line, major water storage, watercourse or wetland.

Drainage feature protection area

A strip of land with retained vegetation along each side of a drainage feature to retard the lateral flow of runoff water, to cause deposition of transported material, thereby reducing sediment movement into the drainage feature and reducing the risk of erosion of the channel and banks on either side of the feature.

Drainage line

A channel down which surface water naturally concentrates and flows, conveying water only during or immediately after (hours or days) periods of heavy rainfall. Drainage lines exhibit one or both of the following features which distinguish them from drainage depressions:

- (a) evidence of active erosion or deposition - e.g., gravel, pebble, rock or sand bed; or,
- (b) an incised channel of more than 30 centimetres depth with clearly defined bed and banks.

In some catchments trickle flows may be sustained in the channel of a drainage line by groundwater seepage and may become continuous except during periods of drought. (*See also Trickle flow*)

Employee representative (safety)

Includes an employee member of a health and safety committee where established in the workplace, or a person elected to represent a group of employees on health and safety matters.

Employee

An individual who works under a contract of employment, apprenticeship or traineeship.

Employer

A corporation or an individual who employs persons under a contract of employment, apprenticeship or traineeship. Note: The definition of employer includes the self-employed, which means a person who works for gain, other than under a contract of employment, apprenticeship or traineeship, whether or not that person employs others.

Erosion

The wearing away of the land by running water, rainfall, wind, ice or geological agents.

Erodibility (soils)

The susceptibility of a soil to erosion due to rainfall and the surface runoff or water.

Erosivity:

The measure of the ability of rainfall to cause erosion.

Fertiliser

Any substance or organism that is used as a means for directly or indirectly:

- (a) supplying nutriment for the purpose of enhancing the development, productivity, quality or reproductive capacity of vegetation;
- or,
- (b) affecting the nature or composition of soil or any other matter in which vegetation is grown.

Firebreak

An area of cleared land made and maintained to check the spread of fire.

Flammable liquid

A liquid which is capable of being ignited and burning in air and which meets the criteria of the ADG Code.

Flammable

A substance is capable of being ignited and burning in air.

FSCBG (aerial application of solids and sprays to crops)

Forest **S**ervice **C**ramer **B**arry **G**rimm. A mathematically-based computer model developed by the US Forest Service and US Army to predict the downwind dispersion and deposition of aeriially-released material.

Gravelling

Providing natural surface roads or tracks with a running surface of harder rocky material.

Ground-cover

Material which covers the ground surface and has the effect of reducing erosion. Ground-cover may include living or dead vegetation, leaf litter, tree debris, gravel, rock, straw, mulch and jute mesh.

Hazard (dangerous goods and hazardous substances)

An intrinsic capacity associated with an agent or process capable of causing harm.

Hazard reduction burning

Removing fuel by deliberately-lit controlled fire.

Hazardous substance

A substance which;

(a) is listed in the National Occupational Health and Safety Commissions List of Designated Hazardous Substances NOHSC: 10005(1994)]; or,

or (b) has been classified as a hazardous substance by the manufacturer importer, in accordance with the National Occupational Health and Safety Commission's Approved Criteria for Classifying Hazardous Substances OHSC:1008 (1994)].

Health surveillance (hazardous substances)

The monitoring of individuals for the purpose of identifying changes in health status due to occupational exposure to hazardous substances. It includes biological monitoring.

Joint venture (Forests NSW NSW Eucalypt Plantation Program)

A contractual arrangement in which other parties provide land or money for Forests NSW to establish and/or manage plantations.

Label (agricultural chemicals)

A set of information on a container which identifies the substance in the container, identifies whether the substance is hazardous and provides basic information about the safe use and handling of the substance. In the case of pesticides, label instructions are mandatory, unless permits for off-label use are obtained from NRA or EPA.

Major water storage

A dam constructed for public irrigation or the supply of town water.

Material Safety Data Sheet MSDS (hazardous substances)

A document that describes the properties and uses of a substance, that is: identity; chemical and physical properties; health hazard information; precautions for use; and, safe handling information.

May

A requirement is optional.

Mitre drain

A drain used to conduct runoff water from the shoulders of a road to a disposal area away from the road alignment.

Must

A requirement is mandatory.

Nett planted area

The area planted in a compartment, exclusive of the areas occupied by roads, areas deliberately excluded from planting, and areas that were planted but where seedlings failed to establish.

Noxious animal

A rabbit, wild dog or feral pig, and any other animal or bird of any other species declared under the Rural Lands Protection Act 1989.

Noxious weed

A plant declared to be a noxious weed by an order issued under the Noxious Weeds Act 1993.

Packaging group (dangerous goods)

As defined by the ADG Code, means the division of dangerous goods of Classes 3, 4, 5, 6.1, 8 and 9 into three groups according to the degree of hazard they present:

- I (great danger);
- II (medium danger); and,
- III (minor danger).

Pavement

A hard running surface on a road provided to protect the subgrade from rutting, to increase traction, or to minimise erosion.

Pest

Any vermin or other troublesome or destructive form of animal life.

Pesticide (agricultural chemicals)

Any substance or organism that is manufactured, represented, sold or used as a means for directly or indirectly:

- a) destroying, stupefying, repelling, inhibiting the feeding of, or preventing infestation by or attacks of, any pest; or,
- (b) attracting any pest for the purposes of its destruction; or,

- (c) destroying vegetation or altering its natural development, productivity, quality or reproductive capacity; or,
- (d) destroying or rendering ineffective, or regulating the effect of, a fungus or any other parasitic vegetation, bacteria or a virus.

Plantation

A forest established by the planting of native species or exotic species of trees and managed intensively, usually for timber production.

Pollution

Has the same meaning as under the Clean Waters Act 1970.

Prescribed stream

A river, creek, effluent or lake within the meaning of section 21B(i) of the Soil Conservation Act 1938.

Protected land

Land defined in Division 2 of the Soil Conservation Act 1938. Generally it is land depicted on a protected land map, with a slope greater than 18⁰, situated within 20 metres of the banks of any river or lake, or otherwise environmentally sensitive.

Protection area

A strip of land along each side of a plantation drainage feature in which special conditions are applied.

Provenance

A distinct variety of plant, usually from a particular naturally growing population.

Pruning

Removal of tree branches.

Register

A listing of all hazardous substances which are used or produced in the workplace. The minimum information which shall be included in a register is the available Material Safety Data Sheets for all hazardous substances as required by the hazardous substances regulation.

Regrowth

Natural regenerated native vegetation, on previously cleared land.

Rehabilitate

To return an area of land or a road or track surface to a stable condition. This may involve reshaping the land, spreading topsoil, constructing banks, revegetating or employing a combination of these techniques.

Relief culvert

A culvert designed to allow water in a table drain to pass under a road.

Responsibility Centre

The lowest level administrative unit of Forests NSW, usually a district.

Revegetate

To establish an effective vegetative groundcover by either natural regeneration or sowing with a seed and fertiliser mixture, in order to prevent soil erosion.

Risk (dangerous goods and hazardous substances)

The likelihood that a substance will cause harm in the circumstance of its use.

Road

Any route used for the vehicular access to a plantation.

Road drainage

Any structure designed to direct water along, across or underneath a road.

Rollover drain

A crossbank constructed with a smooth cross-section and gentle batters, and which is well compacted to allow permanent vehicular trafficability.

Runoff water

The portion of precipitation falling on a catchment area that flows from the catchment past a specified point.

Scheduled (hazardous substances)

A substance is classified under the Standard for the Uniform Scheduling of Drugs and Poisons.

Second rotation

The second crop of trees planted on a particular area of land, usually after harvesting of the first crop.

Shall

A requirement is mandatory.

Should

A recommendation.

Site preparation

The preparation of a plantation site to allow tree planting. Includes clearing, cultivation, weed control.

Sediment

Particles of soil material that have been transported or deposited by weathering action.

Seed orchard

A plantation of genetically superior trees grown for seed production.

SEMGL: *Standard Erosion Mitigation Guidelines for Logging in NSW (1993)*, Produced by DLWC as best practice guidelines for tree harvesting and logging road construction and maintenance.

Substance (dangerous goods and hazardous substances)

Any natural or artificial entity, composite material, mixture or formulation, other than an article.

Substantial debris

In the context of management of drainage feature protection areas, means wood greater than 100 mm in diameter and 3 metres in length.

Supervising Forest Officer

An employee of Forests NSW who is authorised by Forests NSW to supervise particular plantation operations.

Supplier

An importer, manufacturer, wholesaler or distributor of workplace substances, but excludes a retailer.

Table drain

A drain constructed along the side of a road between the shoulder and a cut batter. It collects and drains runoff water away from road surface and also intercepts runoff water from cut batters that might otherwise flow onto the road surface.

Thinning

The planned removal of a proportion of the trees in a plantation.

Trickle flow

The extended low flow which occurs in many catchments following major runoff events. In some catchments, depending on their hydrological characteristics, such flows may be sustained by groundwater seepage and thus become continuous except during periods of drought.

Valuation

The process of placing a monetary value on a crop of trees, usually for accounting purposes.

Vegetative cover

Plant material that protects the soil surface from erosion caused by rain drops or running water. It includes both living plants and dead plant material.

Watercourse

A channel, having defined bed or banks, down which surface water flows on a permanent or semi-permanent basis or, at least, for a substantial time under natural conditions after periods of heavy rainfall within its catchment.

The presence of permanent or semi-permanent water from trickle flow sources does not necessarily mean that a drainage feature is a water course. (*See also Trickle flow*)

Wetland

A vegetated depression with a seasonal or permanent water table at or slightly above the floor of the depression. The vegetation type in a wetland typically indicates a wetter micro-environment than the surrounding country.

Windrow

A linear stack of woody material produced by clearing vegetation.