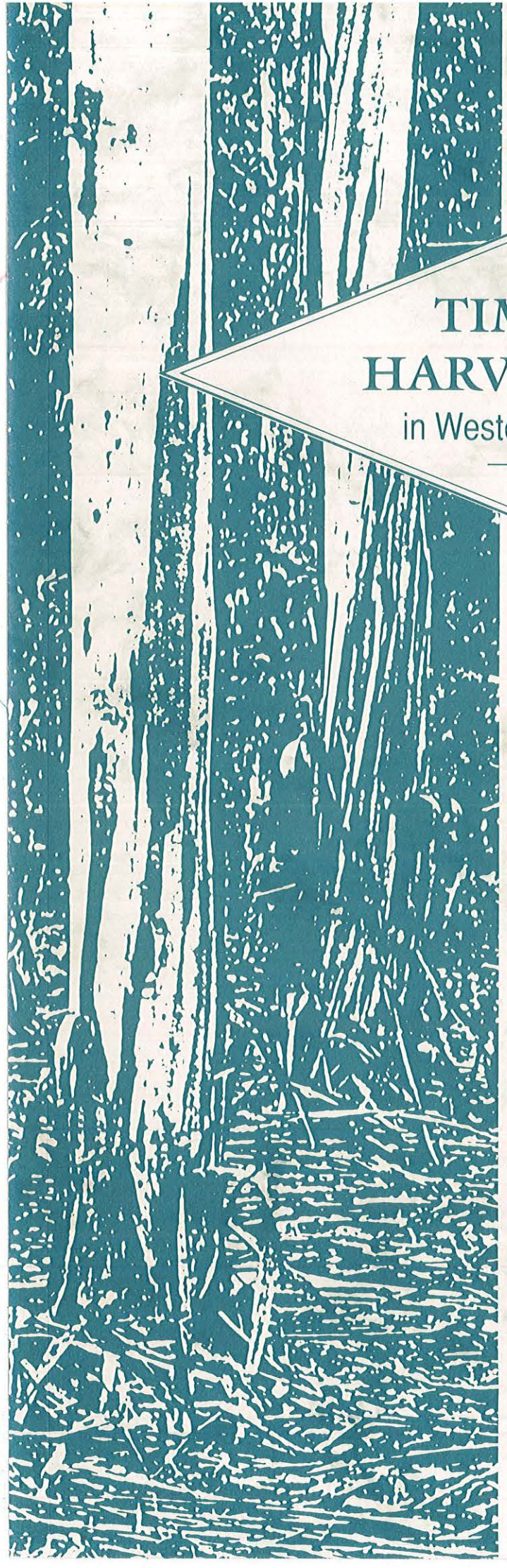

TIMBER HARVESTING

in Western Australia

Department of Conservation and
Land Management

March 1993 Edition

TIMBER HARVESTING
in Western Australia

... a reference document comprising:
the 'Code of Logging Practice', and
the'Manual of Logging Specifications'...

...for timber harvesting on forests and plantations managed by CALM in the South West of Western Australia.

Department of Conservation and Land Management

March 1993 Edition

PREFACE

This new publication "Timber Harvesting in WA" contains revised editions of the "Code of Logging Practice" (the Code) and the "Manual of Logging Specifications" (the Manual).

The Code and the Manual form parts of a hierarchy of rules relevant to timber harvesting operations controlled by the Department of Conservation and Land Management.

- Conservation and Land Management Act (1984).
- Forest Management Regulations 1993 (gazetted 9 February 1993).
- Code of Logging Practice.
- Manual of Logging Specifications.
- Bush Fires Act
- Individual Contracts to Supply negotiated between a logging contractor and CALM.
- Forest Produce licence.

The Code of Logging Practice, originally written in 1976 as a Code of Softwood Logging Practice, is a concise set of rules governing the conduct of timber harvesting operations on State forest and other Crown lands managed by CALM. The Code also applies to operations on any private property within these regions where CALM is responsible for management of timber harvesting operations.

The Manual of Logging Specifications, first published in 1987, complements the Code. It consists of the detailed, quantifiable specifications, together with specifications for all log products. Both the Code and the Manual are an integral part of all Contracts to Supply and all Forest Produce Licences.

Breaches of the Code or the Manual are breaches of the appropriate Contract to Supply or Forest Produce Licence. The Code and the Manual may be amended from time to time, as improvements to the procedures are identified. Amendments will apply as dated. The effect of any amendment on the Contracts to Supply will be taken into account by CALM. I would appreciate receiving suggestions for improvement at any time.

All technical terms used are as defined in the technical paper "Forestry Terminology in Western Australia" by F H McKinnell, Forests Department 1982.

A copy of "Timber Harvesting in WA" must be available in each forest region and district office and the South Coast Regional office. A copy is also held by each CALM officer involved in timber harvesting. Each harvesting contractor will be provided with a copy. Members of the public may purchase "Timber Harvesting in WA" at $10.00 per copy.

The amendments to the Code and the Manual contained herein now apply.

Syd Shea
EXECUTIVE DIRECTOR

February 1993

PART ONE

"CODE OF LOGGING PRACTICE"

PART 1: CODE OF LOGGING PRACTICE

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SECTION 1: DEFINITIONS

In this Code of Logging Practice, unless the context requires otherwise:

"Logging Supervisor"	means the Logging Contractor's on-site representative with day to day responsibility for the performance of the Contractor's servants, agents, employees or subcontractors.
"CALM Act"	means the Conservation and Land Management Act 1984.
"Catchment"	means an area draining into a given waterway or reservoir.
"Cleandown"	means the removal of all potentially infected material from an object. This can be achieved by using a high pressure water jet (washdown), compressed air (blowdown) or a brush (brushdown).
"Contract"	means a contract in which the Executive Director contracts with any person for that person to harvest log timber on Crown land or managed land and to deliver that timber to the buyer.
"Contractor"	means a person who contracts with the Executive Director under a contract to harvest and deliver, including any servants, agents, employees or subcontractors of that person.
"Coupe"	means an area in a State forest or timber reserve that is specifically set aside for the purpose of timber harvesting in a logging plan.
"Delivery"	means the cartage of forest produce from loading points in or near the forest area to a nominated delivery point.
"Department"	means the Department of Conservation and Land Management established under the CALM Act.
"Dieback Disease"	means a disease of certain native species of vegetation, including jarrah, caused by the root rotting fungus *Phytophthora cinnamomi*.
"Extraction"	means the movement of forest produce from the position at which it is felled or cut to a position where it may be loaded onto a vehicle.
"Fellers Block"	means a cutting area, within a coupe, allocated to a single feller or tree felling machine.
"Forest Officer"	means a forest officer as defined in the CALM Act.
"Forest Officer In-Charge" and **"FOIC"**	means any forest officer appointed in writing by the Executive Director to be in charge of any logging site or any part thereof.
"Forest Produce"	means any log or log product that may be removed by a contractor from an operation and includes sawlogs, poles, piles, chip logs, firewood, chips and any other product authorised by a contract or Departmental Licence.
"Forest Representative"	means any Forest Officer, nominated orally or in writing by the Executive Director or the Forest Officer in Charge, to assume some or all of the powers, duties, discretions and authorities of the Forest Officer in Charge.

"Forest Areas"	means any area of land under the ownership, management or control of the Executive Director on which trees are growing and include firebreaks, roads and tracks.
"Hygiene" (in relation to dieback disease)	means actions that decrease the risk of the pathogen being introduced, spread, intensified or surviving.
"Jarrah Forest"	means any forest area dominated by the species *Eucalyptus marginata*.
"Karri Forest"	means any forest area dominated by the species *Eucalyptus diversicolor*.
"Large Fire Organisation"	means the planned deployment of Departmental resources in the event of a major wildfire.
"Licence"	means a licence granted by the Executive Director under Section 88(1)(a) of the Act to take forest produce on CALM land.
"Operation"	means any logging activity, on State forest or other Crown land under the control of the Executive Director, authorised by a written contract between the Executive Director and another party or by a Departmental Licence.
"Pine Plantation"	means any forest area dominated by species of the genus Pinus.
"Soil Dryness Index"	means a measure of soil moisture that reflects the flammability of heavy fuels. It indicates fire suppression difficulty.
"Soil Movement"	means the movement of moist soil sticking to the wheels or tracks of vehicles.
"Stream Reserve"	means a strip of vegetation of a specified width located along a particular watercourse from which logging is excluded.
"Sub-Coupe"	means a cutting area situated within a self draining catchment. A sub-coupe may contain several fellers blocks.
"TIR Act"	means the Timber Industry Regulations Act 1926.
"Work"	means everything and anything that a contractor, under the terms of a Contract or Licence, and this Code of Logging Practice, is required to do in regard to the felling of trees and the preparation, extraction and cartage of the produce therefrom.

SECTION 2: GENERAL

2.1 The rules in this Code shall be observed by all persons participating in any logging operation on land managed by the Department of Conservation and Land Management. If any such person breaches this Code, such a breach may be regarded as grounds for the Forest Officer in Charge raising objection to the continued employment of that person in the forest. In addition it may be regarded as a breach of the contract or Licence.

2.2 A contractor shall comply in all respects with the provisions of this Code of Logging Practice and all Acts of the State of Western Australia, and in particular, the Bush Fires Act 1954, the Conservation and Land Management Act 1984, the Road Traffic Act 1975, the Timber Industry Regulation Act 1926, the Workers Compensation Act 1912, the Wildlife Conservation Act 1950-79, the Agriculture and Related Resources Protection Act 1976-86, the Country Areas Water Supply Act 1947-88, the Water Authority Act 1984-87, and the Occupational Health Safety and Welfare Act 1984-87 including all amendments to those Acts for the time being in force and any Act passed in substitution for or in lieu thereof and all Regulations for the time being in force thereunder.

The "Forest Regulations" made under the Forests Act will continue to apply to all operations by virtue of Section 149 of the Conservation and Land Management Act 1984 until such time as new regulations are made under that Act.

2.3 Only persons in possession of a current Timber Workers Registration Certificate may be employed in timber harvesting and delivery of forest produce. One-off Forest Produce Licence holders may be exempted from this requirement.

2.4 Within 48 hours of the commencement of an operation the contractor shall advise the FOIC either verbally or by notice in writing, the name and address of any employee who is engaged by the contractor in cutting and/or removal of forest produce or who for any reason ceases to be engaged by the contractor in cutting and/or removal of forest produce.

2.5 The FOIC reserves the right to limit or otherwise control the hours of work and days of work of all personnel working in the forest. A contractor will take due note of any instruction from the FOIC in this regard and such instruction will be deemed to apply until revoked and will apply equally to the contractor and any of his employees.

2.6 A contractor shall exercise strict supervision and control over operations of all workers employed by him, with a view to:

(a) preventing any breach of the Conservation and Land Management Act and Regulations, the TIR Act and Regulations and this Code of Practice.

(b) preventing damage to other standing timber during timber harvesting and delivery operations in accordance with current silvicultural prescriptions.

2.7 All operations carried out by, or on behalf of, a contractor in forest areas shall be carried out as directed by the FOIC. Any monetary penalties for breaches of this Code or for damage to or waste of timber in breach of the instructions of this Code will be deducted from any money due to the contractor, or failing that from the contractor's deposit.

2.8 A contractor and all persons authorised by him, in carrying out all aspects of an operation, shall follow and use only such paths, tracks and roads in the forest areas as may be indicated to him by the FOIC.

2.9 A contractor shall not cut through, break down or otherwise interfere with any fencing or other improvements erected upon or adjacent to the forest areas.

2.10 A contractor shall keep closed all gates used and shall take all necessary action to prevent the ingress or egress of stock into or from any forest areas enclosed by fences which may have been damaged as a result of his logging operations.

2.11 A contractor must ensure that all major roads as nominated by the FOIC are left open at the cessation of work each day, or if required, during the day, to allow access for fire control and administrative purposes. All other roads and tracks in a coupe or sub-coupe may be blocked in the course of logging operations but access must be restored to the satisfaction of the FOIC upon completion of logging.

2.12 A contractor shall at his own expense and without delay make good any damage to fences, telephone lines or other improvements, resulting directly or indirectly from his operations.

2.13 When directed by the FOIC a contractor may fell, cut and remove forest produce, on areas of State forest or other Crown land controlled by the Department subject to pastoral or other lease or holding, provided always that the authority hereby given shall not relieve or be deemed to relieve the contractor from liability to lessees or holders in respect of any actionable damage caused by the contractor upon such pastoral or other leases.

2.14 A contractor is expected to have his work area in a tidy and workmanlike condition at all times but particularly when leaving the area. If a subsequent clean up is required the work will be done at the contractor's expense.

2.15 A contractor shall dispose of all litter, food scraps, refuse, unserviceable equipment or machinery, or other debris resulting from his operations in the forest areas at such place and in such manner and time as the FOIC shall direct. The discharge of used engine oil onto the ground in any forest area is not permitted. If a subsequent clean-up is required the work will be done at the contractor's expense.

2.16 A contractor shall observe any instruction by the FOIC and comply with any procedures laid down to restrict the spread of jarrah dieback. In particular a contractor shall ensure that equipment is provided to remove soil from logging machinery during the period of the operation.

SECTION 3: FELLING, TRIMMING AND CROSSCUTTING

3.1 All felling, trimming and crosscutting shall be carried out in such place, order, time and manner as the FOIC shall from time to time approve.

3.2 Felling, trimming and crosscutting can be done either by hand or with machine. Felling by machines such as feller-bunchers or harvesters will be permitted only after specific approval for the use of each type of machine has been given by the Executive Director through the FOIC.

3.3 All hand fellers employed by the contractor must hold a current fellers registration certificate under the provisions of the Act and strictly adhere to the provisions contained therein with regard to the use of his identification code.

3.4 A contractor is required to confine his felling activity to certain coupes, sub-coupes and/or fellers blocks within the cutting areas. These areas must be felled to the satisfaction of the FOIC before further areas will be made available for felling.

3.5 Marking of Trees for Removal

(a) Where trees are marked for removal a contractor shall fell and utilise only such trees as have been marked or otherwise indicated for the purpose by a Forest Officer. All such trees are to be felled if in the opinion of the FOIC they contain log produce designated as such under the conditions of the Operation.

(b) A contractor shall not fell, damage or utilise any unmarked trees.

(c) If a contractor wishes to cut unmarked trees to assist his operation, eg: widening vehicle tracks, extending landings, he shall refer the matter to the FOIC and such trees will not be cut until marked by a Forest Officer.

3.6 Marking of Trees for Retention

(a) Trees to be retained as crop trees will be marked or otherwise indicated by a Forest Officer. All other trees in the coupe are to be felled if in the opinion of the FOIC they contain log produce designated as such under the conditions of the operation.

(b) A contractor shall not fell, damage or utilise any tree marked for retention by a Forest Officer.

(c) If a contractor wishes to cut marked (retained) trees to assist his operation, eg: widening vehicle tracks, extending landings, he shall refer the matter to the FOIC and such trees will not be cut until released by a Forest Officer.

3.7 A contractor shall incur penalties at rates determined by the Executive Director for any wood contained in any trees felled by him in breach of Clauses 3.5 and 3.6. Any penalties will be charged under Clause 2.7 of this Code. Such trees shall remain the property of the Department.

3.8 All trees, however marked or indicated for felling must be felled and utilised to the satisfaction of the FOIC.

3.9 Trees shall be felled so that the stump height takes into account the balanced need for maximum utilisation and maximum safety requirements.

3.10 All felling, trimming and crosscutting is to be carried out without damage to retained standing trees.

Where standing trees are damaged by him a contractor shall be liable for such damage at rates determined by the Executive Director. Any penalties will be charged under Clause 2.7 of this Code. Such damaged trees shall remain the property of the Department.

3.11 All logs shall be trimmed to remove all limbs flush with the log including epicormic twigs and branches with foliage attached.

3.12 All felling, trimming and crosscutting shall be carried out to ensure maximum log utilisation to current log specifications as laid down by the Executive Director. Where in the opinion of a FOIC log preparation results in excessive waste a contractor shall be liable for payment for such waste at rates determined by the Executive Director.

3.13 A contractor shall be liable to pay the Department for all wood not cut in accordance with Clauses 3.8, 3.9 and 3.12 at rates determined by the Executive Director.

3.14 Trees which have been scarfed or part-scarfed shall not be left standing. If this is not possible, for example because of a mechanical breakdown, the logging supervisor on the site and/or a Forest Officer must be informed immediately. Arrangements must then be made to fell the tree at the earliest possible opportunity.

3.15 "Hangups" shall be dislodged and cut-off tops shall not be left leaning against standing trees.

3.16 The tops and branches of any trees felled by the contractor which fall close to retained crop trees shall be cleared away from the crop trees into open spaces to the satisfaction of the FOIC.

3.17 All tops, slash and other debris generated by the operation shall be cleared from roads, firebreaks, creeks, landings and logging tracks as directed by the FOIC.

SECTION 4: EXTRACTION

4.1 All extraction shall be carried out in such places, order, time and manner as the FOIC shall from time to time approve.

4.2 The FOIC may determine the priority of extraction of produce from time to time. A contractor shall comply with the FOIC's expressed priority of extraction. This priority may be expressed as type of log, point of removal, dieback hygiene requirements, and/or deadline for delivery.

4.3 A contractor is required to confine his extraction activity to certain coupes, sub-coupes and/or feller's blocks within the cutting areas. These defined areas must be extracted to the satisfaction of the FOIC before further areas will be made available for extraction. Extraction in these cases may include associated erosion control work.

4.4 If a contractor wishes to construct temporary extraction tracks within the forest areas, the location of such tracks shall be approved by the FOIC before construction and all tracks shall be constructed to the satisfaction of the FOIC and at the contractor's expense.

4.5 All extraction is to be carried out without damage to retained standing trees. Where standing trees are damaged by him a contractor shall be liable for such damage at rates determined by the Executive Director. Any penalties will be charged under Clause 2.7 of this Code. Such damaged trees shall remain the property of the Department.

4.6 In the interests of dieback hygiene, extraction may be restricted or prohibited under Section 7 - Jarrah Dieback.

4.7 The FOIC may at his discretion prohibit all extraction or particular methods of extraction or particular items of equipment used for extraction at such times and places as in his opinion are causing, or are likely to cause, excessive soil damage or excessive crop tree damage.

4.8 A contractor shall not carry on extraction at such times or places, or by methods or equipment which the FOIC has prohibited until such prohibition has been revoked by the FOIC.

4.9 At the completion of extraction or during temporary cessation of extraction, erosion control work must be completed. All extraction tracks and temporary roads subject to erosion will have cross drains installed as prescribed by the FOIC.

SECTION 5: ROADING

5.1 Unless otherwise decided the location, construction and maintenance standard of all logging roads shall be as determined and directed by the FOIC.

5.2 Unless otherwise indicated by Act of Parliament or by the Executive Director, all roads constructed on State forest or other Crown land controlled by the Department, shall be deemed to be Departmental roads, irrespective of the organisation responsible for the cost of construction and maintenance of such roads.

5.3 Any contractor involved in road construction and/or maintenance shall observe any instruction and comply with any procedures laid down to restrict the spread of jarrah dieback (See Section 7).

SECTION 6: LOADING AND DELIVERY

6.1 All loading and delivery shall be carried out in such place, order, time and manner as the FOIC shall from time to time approve.

6.2 The FOIC may determine the priority of loading and delivery of produce from time to time. A contractor shall comply with the FOIC's expressed priority of loading. This priority may be expressed in type of log, point of removal, dieback hygiene requirements and/or deadline for delivery.

6.3 A contractor is required to confine his loading and delivery activity to certain coupes, sub-coupes and/or feller's blocks within the cutting area. Produce from these areas must be loaded and delivered to the satisfaction of the FOIC before further areas will be made available for loading and delivery. Loading and delivery in these cases may include associated log landing rehabilitation work.

6.4 Access to the loading points within the forest areas may be restricted by the FOIC at any time by:

[a] Nomination of the route to be followed by loaded and empty trucks when entering and travelling through areas controlled by the Department.

[b] Nomination of hours of any day during which work may be carried out.

[c] Nomination of the days of the week during which work may be carried out, and

[d] Suspension of delivery because of disease control requirements, road conditions and/or weather conditions.

6.5 A contractor shall at his own expense, when stipulated under the terms of his Contract or Licence, maintain to the satisfaction of the FOIC Departmental roads used by him for delivery. If the contractor is unable to complete this work within the time limits set out by the FOIC another party may be employed at the contractor's expense to ensure the work is completed in time.

6.6 Loading and delivery of logs and timber shall be carried out with a minimum of damage to standing trees. Where standing trees are damaged by him a contractor shall be liable for such damage at rates determined by the Executive Director. Any penalties will be charged under Clause 2.7 of this Code. Such damaged trees shall remain the property of the Department.

6.7 A contractor shall observe any instruction and comply with any procedures laid down to restrict the spread of dieback disease (See Section 7).

6.8 The FOIC may at his discretion prohibit loading and delivery or particular methods of loading and delivery at such times and places as in his opinion are causing, or are likely to cause, excessive soil damage, excessive crop tree damage and/or excessive road damage.

6.9 A contractor shall not carry on loading and delivery at such times or places, or by methods or equipment which the FOIC has prohibited until such prohibition has been revoked by the FOIC.

6.10 To minimise damage to forest roads and to promote safety in operation log trucks must not be loaded in excess of their design capacity.

6.11 Truck drivers are responsible for the safe loading of their trucks in regard to overloading, overwidth and height, overlength and load security and are responsible for the loss of a load or part thereof.

6.12 Protruding limbs, loose bark or trailing debris of any kind on trucks is not permitted and must be removed by the driver before leaving the loading point or immediately when noticed "en route".

6.13 The driver should stop and check the safety of the load at least once while travelling to his destination. The driver must stop and check the safety of the load if a major public road is part of the haul route.

6.14 The loss of any log or logs from a load during hauling must be reported immediately to a Forest Officer. Logs must be recovered promptly by the contractor and any cost incurred in the recovery is the responsibility of the contractor. If logs lost from a load are not recovered by the contractor within a time acceptable to the FOIC the FOIC will organise recovery of the logs and charge all costs to the contractor. If necessary the costs will be recovered under Clause 2.7.

6.15 If quick release stanchions are fitted to a truck these shall not be released for unloading until the unloading supervisor gives his permission.

6.16 Speed limits as laid down by the Police Department will apply on both public and Departmental roads. The Department reserves the right to introduce lower speed limits on any or all Departmental roads in the interests of greater safety of operation or to lessen damage to the road. All speed limits must be adhered to.

6.17 Where drivers come under notice of the Department for speeding on Departmental roads or are persistent offenders in this regard the provisions of Clause 2.1 of this Code may be invoked.

6.18 The FOIC and/or Inspector under the Timber Industry Regulation or Occupational Health Safety and Welfare Acts may require a contractor to provide and install suitable signs on Departmental roads to warn road users of the presence of log hauling trucks. (See also Clause 6.19)

6.19 Any traffic control signs required to be displayed by the contractor shall conform with the standard for traffic control signs laid down by the Main Roads Department.

6.20 The Department reserves the right to decide whether any vehicle is in a fit condition for the job it is doing bearing in mind road conditions, road grades and load carried. Contractors will, on request by the FOIC make their vehicles available to the Department for inspection.

6.21 If, after inspection, the FOIC decides that in his opinion a vehicle's mechanical condition renders it unfit for the job, the contractor will be required to repair the vehicle to the satisfaction of the FOIC before it can be used further on the job.

6.22 Engine exhaust pipe systems must be installed so that they do not blow down onto the roadway.

6.23 On dusty roads drivers are to keep a suitable distance apart to allow other traffic and road repair crews better visibility.

6.24 Standard double-sided reflective warning triangles shall be carried by all haulage vehicles and shall be displayed, if a vehicle breaks down, as follows:

[a] one triangle 100-150 metres in front of the vehicle and 1.5 metres out from the road edge on the same side as the vehicle;

[b] as for [a] but to the rear of the vehicle;

[c] one triangle alongside the mid point of the vehicle on the side nearest the centre of the road.

6.25 **When haulage takes place on privately owned or maintained roads, any Road User Regulations or road maintenance charges in force for such roads must be strictly adhered to.**

SECTION 7: ENVIRONMENTAL PROTECTION

Dieback Disease

7.1 Soil must not be transported from areas infected with dieback to areas free of dieback.

7.2 The necessary hygiene logging procedures required to meet this objective involve all or any of:

[a] the complete separation in time of the skidding and loading phases of logging;

[b] the use of stationary (heel-boom) loaders;

[c] the use of a physical barrier at the front and/or rear of landings to separate the extraction and loading components of logging, the positioning of the barrier at each landing to be determined by a Forest Officer.

[d] cleaning down of all harvesting machinery before movement between coupes.

7.3 Within areas free of dieback, movement of soil during extraction may be permitted subject to:

[a] Paragraph 7.1 above

[b] hygiene requirements contained in Specification 5.1 of the Manual of Logging Specifications, and

[c] paragraph 7.35 of this Code.

7.4 A contractor will comply with instructions from a Forest Officer concerning inspections and cleaning down of machinery or equipment. During dry soil conditions an air compressor (with hoses of adequate length and appropriate nozzles or an acceptable alternative) may be used. During moist soil conditions a portable pumper unit and a portable washdown ramp constructed to the specifications approved by the FOIC will be required. Water used for cleaning down must be treated with chemical as specified by a Forest Officer.

7.5 A contractor will comply with any instruction applying to the movement of light vehicles, logging equipment, road haulage equipment, road construction equipment and the winning, carting and laying of road materials, such as gravel and shale.

7.6 The contractor, and in particular his logging supervisor, must make themselves fully familiar with restrictions regarding soil movement. All or some of the employees of a contractor working in the forest areas shall be trained to a level of competence in dieback hygiene acceptable to a Forest Officer.

Fire - All Forest Areas

7.10 Particular attention must be paid to the sections of the Conservation and Land Management Act and the Bush Fires Act and to Regulations made under those Acts for the purpose of controlling fires.

7.11 No fires are to be lit in any forest area without the express permission of a Forest Officer.

7.12 A Forest Officer may exempt a contractor and his employees from the requirements of Clause 7.11 when in the opinion of the Forest Officer weather conditions allow. This could normally be expected in winter.

7.13 A contractor shall take all necessary precaution to prevent the occurrence or spread of fire in any forest area. A contractor shall be liable to the Executive Director for suppression costs and damage caused within the said areas or on any State forest, timber reserve or Crown land by any fire on, or extending from, the said area unless the contractor can prove to the satisfaction of the Executive Director that such fire or fires without any act or omission on the part of the contractor originated outside the said area and/or arose through some cause beyond his control.

7.14 A contractor and all his employees shall co-operate with officers of the Department in preventing and suppressing bushfires and shall, when called upon by a Forest Officer, act under his instructions in fire fighting or preventing outbreaks of fire.

7.15 A contractor shall not use or permit the use of any chainsaw or other internal combustion engine in any forest area unless the engine is fitted with an exhaust system of a type and design approved by the Executive Director. The exhaust system must be inspected regularly by the contractor to ensure that its efficiency is maintained. Spark arrestors of a YUBA or equivalent type must be fitted to all petrol and diesel engines other than turbo charged diesels.

7.16 Every logging machine involved in felling, extraction or loading must carry a suitable fire extinguisher (Bush Fires Reg 37).

7.17 The contractor shall keep all logging machines free of accumulated combustible material, particularly the spaces between the engine and engine guards.

7.18 The contractor may establish in any forest area not more than one dump of fuel per logging unit on a site and of a size approved by the FOIC. The ground around such dump shall at all times be clear of all vegetation or inflammable debris for a distance of not less than 6 metres.

7.19 Smoking shall not be permitted within 6 metres of the closest point of a fuel dump.

7.20 If a Large Fire Organisation is declared in a Departmental administrative Region, any or all logging operations in that Region may, at the direction of the FOIC be suspended for the whole or part of the duration of that Large Fire Organisation.

7.21 The Executive Director may require that all or some of the employees of a contractor working in a hardwood forest area be trained to a level of competence in fire suppression acceptable to a Forest Officer.

7.22 The Executive Director will accept no liability for the loss or damage by fire, however started, of any equipment or property owned or operated by a contractor or any of his employees.

Fire - Pine Plantations

7.23 Smoking is prohibited in all pine plantations except where the ground has been cleared of all vegetation or inflammable material. Butts and spent matches must be deposited on bare mineral soil and buried. A Forest Officer may exempt a contractor from this requirement when, in the opinion of the Forest Officer, weather conditions allow. This could normally be expected in winter.

7.24 All chainsaw operators working in pine plantations must have in their immediate work area a pack spray of a type, size and colour approved by a Forest Officer. "Immediate work area" is defined as the area within 150m distance of feller activity. The pack spray must always be full of water and be in good working order.

7.25 The fuelling of chainsaws, vehicles or other powered equipment or the mixing of fuel shall not be carried out in pine plantations except on firebreaks, tracks or roads where the ground is clear of all vegetation or inflammable material for a distance of not less than 1.5 metres around the fuelling position.

7.26 A contractor shall not start or permit to be started any chainsaw immediately after fuelling until the chainsaw has been wiped to remove any spillage and has been moved clear of the place at which the fuelling was carried out.

7.27 Where chainsaws and harvesting machines are being used in the pine plantation a contractor shall ensure:

either:

[a] that no chainsaw or harvesting machine is used for at least 60 minutes prior to the operator leaving the work area and that immediately before leaving the pine plantation the operator inspects the area covered by the last 2 hours of chainsawing or harvesting machine activity; OR

[b] that a patrol or inspection of each area fallen or worked over by machines in the last 2 hours of each working day is made, not less than 1 hour and not more than 2 hours after the chainsawing or harvesting activity has ceased. This inspection must be made by some responsible person nominated by the contractor and approved by a Forest Officer, and

[c] when harvesting activity ceases, all harvesting machinery must be parked on a site cleared to mineral earth and approved by a Forest Officer.

A Forest Officer may exempt a contractor from these requirements when in the opinion of the Forest Officer weather conditions allow. This could normally be expected in winter.

7.28 A Forest Officer may prohibit any or all types of logging operations in the pine plantation at such times and for such periods as is necessary when in the Officer's opinion such action is warranted by the Department's Fire Danger ratings.

7.29 A contractor will ensure that up to 50% of his bush employees, as required by the Department, are made available for training in fire control, in order to supplement the Department's fire control forces. The nominated contractor employees will be required to attend training for up to six days in the first year to become qualified - three days of theory training and three days of practical training. In subsequent years, training will involve three days of practical training each year to maintain qualifications. A contractor is required to make the nominated employees available for training at his expense, at times and places as agreed to by the contractor and the FOIC.

7.30 Training staff and sites will be provided by the Department at no cost to a contractor and in reasonable proximity to a contractor's work sites.

7.31 If a fire starts in a contractor's work site within the pine plantation the contractor's crew must immediately endeavour to suppress the fire with their own equipment under the leadership of the logging supervisor. As soon as a Forest Officer arrives at the fire the contractor's crew must work under the direction of that Officer. The whole of the contractor's manpower will continue to operate under the Department's control until relieved or until the fire is declared safe by the senior Departmental Forest Officer directing the fire suppression operation. Costs incurred by the contractor must be borne by the contractor.

7.32 If a fire starts outside a contractor's work site but within the pine plantation the provisions of Clause 7.31 will apply. However, if in the opinion of the FOIC the fire was not caused by or did not arise from any negligent act or omission or any want of co-operation on the part of the contractor or any of his employees, the costs incurred by the contractor in fighting the fire will be borne by the Department. Certification for payment will be by the senior Departmental Forest Officer directing the operation. In the event of dispute, the Executive Director's decision will be final.

7.33 A contractor and his crew working within a pine plantation will not normally be called on to fight fires outside the pine plantation but if this is necessary the provisions of the Conservation and Land Management Act and the Bush Fires Act will apply.

7.34 A contractor will at all times, at the contractor's own expense provide on-site and maintain in good working order to the satisfaction of the FOIC firefighting hand tools and equipment complying with the current Department specifications on the following basis:

[a] For every 5 men or part thereof employed in the pine plantation (excluding personnel engaged solely in log delivery operations):-

1 chainsaw
2 knapsack sprays with water
2 squared off round mouth shovels
1 rake hoe

Knapsack sprays and chainsaws provided as part of the normal equipment for fellers under the Code will be considered as equipment for this purpose.

[b] One fire suppression unit for each group of ten workers employed on the contract at any one pine plantation worksite (excluding personnel engaged solely in log delivery operations) with a minimum of one unit on each pine plantation worksite.

This fire suppression unit will be of a standard acceptable to the FOIC, and should be similar to the standard 450 litre patrol unit currently used by the Department.

The patrol unit will be the "slip-on" type mounted on its own prime mover.

[c] The contractor will at all times and at his own expense maintain each of the fire suppression units specified in Clause 7.34[b] to an operational standard acceptable to the FOIC. If in the opinion of the FOIC the condition of a unit makes it unsuitable for fire suppression the FOIC may either:

(i) suspend operations until the unit is repaired to his satisfaction; OR

(ii) arrange the repair of the unit to his satisfaction and the supply of a replacement unit all at the contractor's expense until such time as the contractor's own unit is passed as suitable.

Soil

7.35 The FOIC may at his discretion prohibit all felling, extraction, loading and hauling or particular methods or equipment used for felling, extraction, loading and hauling at such times and places as in his opinion are causing or are likely to cause excessive soil damage.

7.36 **At the completion of extraction or during temporary cessation of extraction, erosion control work must be completed. Extraction tracks and temporary roads subject to erosion must have cross drains installed, as prescribed by a Forest Officer.**

7.37 The maximum level of damaged soil in any coupe, sub-coupe or feller's block shall not exceed certain specified limits at the completion of extraction. Damaged soil is defined as soil which has been subject to any of the following:

[a] The A soil horizon (topsoil) removed.

[b] The A soil horizon (topsoil) mixed with the B soil horizon (sub-soil usually containing clay).

[c] Severe compaction. (Normally meaning compaction which will affect germination or plant growth.)

Surveys will be conducted to determine the percentage area of each fellers block or coupe where soil has been damaged by extraction.

If the level of damage exceeds the specified limit then the fellers block or coupe will be closed and the contractor will be moved to the most suitable logging area available. If damage exceeds the specified limit in the most suitable area the whole operation will be closed.

After a coupe is closed it will not be re-opened until the local Soil Dryness Index exceeds the limit specified by the FOIC.

7.38 A contractor shall at his expense when so required by the FOIC repair all soil damaged by logging. Rehabilitation work shall be carried out during the summer following logging to the satisfaction of the FOIC.

7.39 A contractor shall at his expense carry out any measures specified by the FOIC to prepare denuded areas for revegetation. These areas shall include landings, gravel pits and temporary roads used during the logging operation.

7.40 If a contractor fails to minimise and/or repair soil damage as required by the FOIC any necessary work may be done by the FOIC at the contractor's expense and the money expended may be recouped under Clause 2.7.

Noxious and Environmental Weeds

7.41 A contractor will take any precautions nominated by a Forest Officer to prevent the introduction or spread of noxious and environmental weeds during his logging operation. Where necessary, a Forest Officer may require cleaning down of equipment or other practices to prevent the introduction or spread of noxious and environmental weeds.

Feral Animals

7.42 A contractor shall not interfere with any activities taking place to control feral animals.

Rare Flora and Fauna

7.43 A contractor, upon being notified by a Forest Officer of the occurrence of a particular species of rare flora in his logging area, shall take the necessary steps as nominated by the FOIC to ensure that damage to or taking of the species does not occur.

7.44 A contractor shall take all necessary steps to minimise damage to all species of protected native fauna.

Water

7.45 A contractor shall take any special measures prescribed by the FOIC for the protection of water purity in water courses in or adjacent to forest areas in which he is working.

7.46 A contractor shall ensure that no logging machinery or vehicles enter stream reserves, unless authorised by a Forest Officer.

7.47 All culverts and road drains shall be kept clean of soil, slash or other debris likely to obstruct the flow of water. Damage caused to roads by a failure to carry out this instruction will be regarded as damage covered by Clause 2.7.

SECTION 8: QUANTITY DETERMINATION, RECORDING AND PAYMENT

8.1 The determination of log quantity will be by the Departmental method currently applying for the particular log product type and/or Contract of Sale. These methods are:

[a] **True volume under bark for individual logs, using length and mid diameter under bark measurements and the appropriate Department Hardwood Volume Table (eg:** hardwood sawlogs).

[b] Weight as measured by approved weighbridge (eg: hardwood sawlogs and chiplogs).

[c] Number of pieces by length class (eg: SEC poles).

[d] Number of pieces by length and crown diameter class (eg: bridge timbers).

[e] True volume under bark for individual logs, using length and small end diameter under bark class and the appropriate Department Log Volume Table (eg: softwood sawlogs).

[f] True volume under bark calculated by bin measure using the appropriate conversion factor (eg: pine particle board logs).

8.2 No delivery of logs of any type may take place unless the truck driver is in possession of a completed Delivery Note or other approved documentation to cover the load he is carrying. The contractor will be responsible for ensuring that the Delivery Note or other approved documentation is certified as received by the authorised representative of the receiver before passing to him the original and/or the purchaser's copy of the approved docket.

8.3 Payment/invoicing to all parties will proceed only on the basis of the original copy of the Delivery Note or other approved documentation, correctly completed and certified by a Forest Officer or other person authorised by the Executive Director.

8.4 On receipt from a Forest Officer of a certificate covering completed Delivery Notes or other approved documentation the Accountant or other person authorised by the Executive Director shall pay the contractor for any work done in accordance with the terms of the contract. This payment will normally be made twice per month. Payment at any other time will be made only for good cause as shown by the contractor and deemed by the FOIC in his absolute discretion to be sufficient to warrant such payment being made to the contractor.

8.5 Payments made under Clause 8.4 will be subject to deduction of any amounts certified by the FOIC as payable by the contractor under Clauses 2.7, 2.14, 2.15, 3.7, 3.10, 3.12, 3.13, 4.5, 6.5, 6.6, 6.14, 7.40 and 7.47 of this Code.

8.6 The FOIC will use his best endeavours to ensure that all payments to the contractor under Clause 8.4 are made promptly.

SECTION 9: SAFETY

9.1 A contractor shall comply with the safety requirements laid down by the FOIC, and adhere strictly to the demands and instructions of a District Timber Inspector, appointed under the Timber Industry Regulation Act (1926) or the Occupational Health Safety and Welfare Act (1984-87).

9.2 Safety helmets shall be worn in all forest areas at all times by all persons engaged in logging (TIR Reg 56).

9.3 Safety boots shall be worn in all forest areas at all times by all persons engaged in logging.

9.4 A contractor must provide a First Aid Kit of a type, size and specification acceptable to a TIR Inspector (TIR Reg 37). The container for this kit must adequately protect the contents and it must be located for easy access by all employees.

9.5 The FOIC reserves the right to prohibit the use of vehicles or equipment which in his opinion are not suited to the task or are considered unsafe.

9.6 The FOIC and/or an Inspector under the Timber Industry Regulation Act, may require a contractor to provide and install suitable signs on Departmental and/or public roads to warn road users of the presence of felling, extraction and delivery operations.

9.7 A contractor shall at the request of the FOIC make himself or his logging supervisors available to participate in the investigation of accidents involving himself, his employees, his vehicles or his equipment.

PART TWO

"MANUAL OF LOGGING SPECIFICATIONS"

PART 2: MANUAL OF LOGGING SPECIFICATIONS

CONTENTS PAGE

SECTION 1 - PLANNING AND MONITORING
SPECIFICATION 1.1 HARVESTING AND REGENERATION PLANS

PART A - HARDWOOD

Complete details are contained in the Department's "Provisional Manual of Hardwood Logging Planning". The following is a summary.

1. Responsibilities

Short and medium term hardwood harvesting and regeneration plans are prepared for and on behalf of the Regional Manager by the Regional Inventory offices in the Swan and Central Forest Regions and by the Resource Planning Officer in the Southern Forest Region.

Responsibilities for preparation of the long term integrated plan for hardwood harvesting is as stated above but the Regional Manager is the authority who is responsible for recommending the plan for approval by the Director of Forests.

In all cases, planners must produce fully integrated plans and consult with Regional staff, District staff, Specialist Branch staff and where relevant Timber Industry Representatives during plan preparation.

2. Plan Types

2.1 Long Term Integrated Plan

This is a strategic level (primary level) plan which at the time of preparation shows the most likely direction harvesting will take for the period of the plan.

Due to the long term nature of the plan (a minimum of 30 years) it is highly likely that circumstances will change during the plan period. Thus the plan should be considered indicative only.

One plan per supply area is produced and is completed by the end of the first week in May in the year of revision (at least once every 5 years).

Primary users of the plan are the Director of Forests, Managers Silviculture and Timber Production Branches, Regional Managers and planners.

2.2 Medium Term Integrated Plan

This is the secondary level integrated harvesting plan which shows in more detail the direction of harvesting over the next 7 years (Swan, CFR) and 7 to 12 years (SFR).

(Note: shorter term medium term integrated harvesting plans may continue to be produced until sufficient staff time is available to produce the 7 & 12 year plans.)

One plan per supply area is produced and is issued by the end of the first week of September.

Primary users of medium term integrated harvesting plans are Districts, Regions, Inventory Branch, Timber Production Branch and planners. These plans shall contain the following information, as a minimum:

1. Contract of Sale details for each customer.

2. Regional summary of available resource.

3. Estimation of product yield in detail (show prescription area, production yield).

4. Silvicultural priority treatment status.

Maps:

1) a 1:250,000 (approx) plan showing approximate locations of proposed cutting areas for each year of the plan.

2) on 1:50,000 black plans show:

- name of block
- boundary of each harvesting year
- compartment number

Additional information should be shown as it becomes available eg., VRM zones, silvicultural status.

2.3 Short Term Integrated Harvesting and Regeneration Plan.

This is the tertiary level integrated harvesting plan which shows in detail proposed harvesting areas over a 2 year period.

One plan per supply area is produced and issued during the first week of September in the Swan and CFR and the first week of January in the SFR.

Primary users of the plan are District staff, Regional staff, Timber Production Branch and Contractors.

These plans shall contain the following information as a minimum:

1) Contract of Sale details (ie., demand).

2) Predicted yield summary (gives a summary of the level of available resource by "with soil movement" and "no soil movement" categories).

3) Predicted yield details (gives level of available resource by "with soil movement" and "no soil movement" categories).

4) A table matching Contract of Sale commitments by product to harvesting contractor supply targets. (This table is updated at least monthly, and is used by Regional and District timber supply staff to monitor contractor's performance and intake to mills.)

The plans shall show:

1) 1:250,000 overview plan showing the approximate location of all proposed logging areas for each year of the plan.

2) 1:50,000 block plan showing proposed harvesting boundaries and major access - also shows CALM grid.

3) 1:25,000 plans showing:

Plan A - Operations plan

- boundary of proposed harvesting area.
- "with soil movement" harvesting areas.
- "no soil movement" harvesting areas.
- CALM mapping grid.
- at least one major cross road.
- stream buffers if known; if not, streams to be highlighted and FOIC to determine stream order in field.
- VRM buffers as they become available.
- special care zones (eg., areas close to domestic dams - refer Section 4.1 of this Manual).
- research and inventory plots.
- strategic burning buffers.
- contours.
- areas previously cut over.
- no entry areas.

Plan B - Hygiene plan - Jarrah areas only
Based on current 230mm photography or ground stripping:

- secure dieback free.
- low potential risk.
- uninterpretable.
- not effectively quarantined.
- high potential risk.
- suspect.
- dieback.

Plan C - Hazard plan - Jarrah areas only

- low.
- moderate.
- high.
- very high.

Plan D - Landform/site vegetation - Jarrah areas only

- landforms as per system 6 study.
- vegetation site types as per field assessment by dieback interpreters.

Other plans may be used which show potential JSI areas, intensive inventory results.

3. Plan Amendment

Harvesting and regeneration plans can only be amended by the planning officer. Amendments must be approved in writing by the Regional Manager.

4. Units of Cutting

The units of cutting in harvesting and regeneration plans must conform to the following heirarchy :

i) Supply Area - specific name allocated by SOHQ
ii) District (if required) - specific name allocated by SOHQ
iii) Forest Block - specific name allocated by SOHQ
iv) Compartment - specific number allocated by Regional Inventory office
v) Coupe - specific number allocated by Regional Inventory office, or District Office if not already allocated
vi) Subcoupe and/or feller's block - specific names or numbers allocated by District.

5. Public Inspection

Short term plans are available for public inspection at relevant Regional and District offices. Plans are to be inspected in the presence of the FOIC and where relevant the District Manager (eg Collie) who will be available to answer any questions that arise.

Questions involving planning methodology should be referred to the Regional Manager.

Medium term and long term harvesting plans are available for public inspection at SOHQ (Timber Production Branch) or the relevant Regional office in the presence of the Regional Manager, R/L Operations or the planner.

In all cases inspections are by appointment only.

6. Pre Operation Checklist

The pre operation checklist (CLM 109, Attachment 1.1.1) is designed to ensure nothing is overlooked by planners or the FOIC and once signed by the Regional Manager is the authority to commence operations. A minimum of one CLM 109 must be prepared for each forest block in which harvesting is planned.

Preparations for harvesting cannot commence until the relevant CLM 109 has been signed by the Regional Manager.

The planner completes and signs Part I of the form which is then issued with the harvesting and regeneration plan to the FOIC. The FOIC completes and signs Part II of the form, returns it to the Regional Manager for his approval. The approved form is returned to the FOIC with a copy to the planner. Field operations may then commence.

7. Field Plans and Checklists

In most operations it is necessary for the Forest Officer in Charge of the operation to prepare a checklist of work required in the field before and during harvesting, and to prepare a sketch diagram of the coupe (commonly referred to as a "blown-up HOCS sheet"). The sketch diagram is drawn sufficiently large to show the following information:

* individually numbered sub-coupes and/or feller's blocks.

* all access roads.

* all watercourses.

* all areas reserved from cutting.

* dieback hygiene boundaries.

* ridgelines.

* location of landings.

* major snig tracks.

* any other information considered necessary.

These sketch diagrams or plans are used to record the progress of cutting and extraction, and silvicultural treatment. The certification of completed logging areas (refer Spec. 4.5) should relate directly to these plans.

8. Monitoring and Records

District staff must maintain up-to-date field records of areas cut over and silviculturally treated. For each coupe, a Coupe Silvicultural Report (CLM 160) must be completed as quickly as possible following the completion of harvesting. (Refer Attachment 1.1.2)

A Post Operation Checklist (CLM 813) must be completed between 12 and 24 months following the completion of harvesting. (Refer Attachment 1.1.3)

PART B - SOFTWOOD

1. Responsibilities

Softwood harvesting plans are prepared by Regions in consultation with Timber Production Branch, other specialist branches, and Districts.

2. Plan Types

Three levels of plans are produced:

2.1 20 year resource plan - a long term rolling plan, issued in January each year.

2.2 5 year plan - a medium term rolling plan issued in October each year. This plan includes landscape (VRM) considerations.

2.3 One year harvesting plan - issued in June each year. This plan details the following information

* areas to be cut
* cutting prescriptions (CLM 709 forms)
* reserve areas
* method of logging
* terrain information (flat, steep, winter, summer)
* contractor and customer information
* mill distances
* yield prediction

3. All cutting must be approved by the relevant Regional Manager.

4. The F.O.I.C. must discuss all proposed cutting areas with the relevant contractor's representative, and carry out joint site inspections prior to commencement of cutting.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

PRE-OPERATION CHECKLIST

BLOCK/COMPARTMENT ..... YEARS OF PLANNED CUT .....

OPERATION CODE(S) ...../...../.....

THIS FORM MUST BE SIGNED BY THE PLANNER, THE FOIC AND THE REGIONAL MANAGER BEFORE FIELD PREPARATIONS FOR LOGGING COMMENCE

** PART I - REGIONAL PLANNERS RESPONSIBILITIES

ITEM	CHECKED YES/NO/NA	ACTION REQUIRED/IMPLICATIONS IF DO NOTHING
1) LAND TENURE +State Land Tenure in comments column. Logging is permitted on State forest, Timber Reserves & Executive Director Land.		
2) CONSERVATION 2.1 National Estate areas shown on plan. (Registered, Interim, nominated.) No logging in these areas without Executive Director approval.		
2.2 Proposed Conservation Reserves in: - CALM Management Plans - EPA systems Red Books - DPUD Regional Plan No logging		
2.3 Former MPA buffer zones not included in 2.1 and 2.2		
3) SILVICULTURE 3.2 Silviculture Priority Plan referred to when preparing plan.		
4) ENVIRONMENTAL 4.1 River & streams shown on plan.		
4.2 Hygiene information shown on plan.		
5) HIGHER LEVEL PLANS/CONTRACTS Plans checked against: 5.1 Timber Strategy Paper.		
5.2 Long & Medium Term Plans.		
5.3 Physically fragile areas.		
5.4 Regionally held Contract of Sale list (eg: demand)		
6) EPA/WAWA 6.1 Catchment zone shown and restrictions on cutting listed.		
6.2 Gazetted catchments shown.		
6.3 Harnessed catchments shown.		
6.4 Salinity zone shown and restrictions on cutting listed.		
6.5 Coupe size restriction listed and adhered to in plan.		
6.6 Do coupes conform to coupe dispersal requirements?		
7) AMENITY AND RECREATION 7.1 VRM zones shown on plan.		
7.2 Recreation sites/walk trails.		

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
PRE-OPERATION CHECKLIST

ITEM	CHECKED YES/NO/NA	ACTION REQUIRED/IMPLICATIONS IF DO NOTHING
8) CULTURAL/ARCHAEOLOGICAL 8.1 Plan checked for Aboriginal sites. 8.2 Plan checked for European historical sites. 8.3 Plan checked archaeological sites.		
9) SCIENTIFIC Locations of Research and Inventory plots noted, location of rare flora, endangered fauna noted.		
10) OTHER OPERATIONS 10.1 Mining plans checked.		
11) LIAISON CHECK 11.1 During plan preparation did planners liaise with: - District staff - Regional Utilisation Officer - Regional Planning Officer - Fire Protecton Branch - Silviculture Branch - VRM Planner - Wildlife Branch - Aboriginal site CALM contact 11.2 Plan conforms with Sensitivity Management Checklist. 11.3 Draft Plan viewed by: [a] Regional Manager & Planner [b] Timber Supply Branch [c] Fire Protection Branch [d] Silviculture Branch [e] VRM Planner 11.4 Has Regional Utilisation Officer prepared: - Contract to Supply Commitments (refer Table 7.5) - Logging coupe preparation priorities (refer Table 7.6)		

Checks by Logging Planner completed subject to the comments in the comments column and plan handed over to FOIC.

..../...../.....
LOGGING PLANNER DATE

** PART I - REGIONAL PLANNERS RESPONSIBILITIES

ITEM	CHECKED YES/NO/NA	ACTION REQUIRED/IMPLICATIONS IF DO NOTHING
1) CONSERVATION 1.1 National Estate Areas (check District sensitivity map and General Manager's sensitivity matrix.) 1.2 Proposed Conservation Reserves: - in CALM Managment Plans - EPA systems Red Books - DPUD Regional Plans (Check District sensitivity map & GM sensitivity mgmt matrix)* 1.3 Former MPA buffers not included in 1.1 or 1.2 (* in 1.2 applies)		

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

PRE-OPERATION CHECKLIST

ITEM	CHECKED YES/NO/NA	ACTION REQUIRED/IMPLICATIONS IF DO NOTHING
2) SILVICULTURE		
2.1 Proposed logging areas checked for regen, seed trees, stand type (Eg: shelterwood, gap, etc)		
2.2 Silviculture prescription prepared.		
2.3 Cutting prescription prepared		
2.4 Nominate officer responsible for completing cutting & silviculture treatment & follow-up records. (HOCS and CLM 160)		
3) ENVIRONMENTAL		
3.1 Widths of river & stream buffer zones nominated and shown on logging plan.		
3.2 Disease boundaries demarcated in the field.		
3.3 7-Way Test completed & approved.		
3.4 Are soil erosion measures required?		
3.5 Are coupe size restrictions known? (If not refer to logging plan)		
3.6 Are special cutting prescriptions required (Eg: if logging proposed low rainfall/intermediate zone, or catchment where normal prescript. do not apply - gazetted and harnessed catchmental).		
3.7 Coupe dispersal as shown in plan will be adhered to.		
3.8 Are there special care zones? (Eg: slopes over 14 degrees)		
4) AMENITY/RECREATION		
4.1 VRM prescriptions available, understood & will be adhered to.		
4.2 Presence of rec. site, fragile areas, noted & considered during operational planning (includes special trees, fragile areas such as caves etc).		
4.3 Do neighbours need to be notified?		
4.4 Do local Shires need to be notified?		
4.5 Do local tourist committees need to be notified?		
4.6 Do local schools need to be notified? (Eg: school bus routes)		
5) CULTURAL/ARCHAEOLOGICAL		
5.1 Does local knowledge give rise to additional: [a] Aboriginal sites [b] European historical sites (No logging in these areas)		
5.2 Do archaeological sites require protection?		

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

PRE-OPERATION CHECKLIST

ITEM	CHECKED YES/NO/NA	ACTION REQUIRED/IMPLICATIONS IF DO NOTHING
6) SCIENTIFIC 6.1 Position of Research plots noted (check with Rsch Bch if logging is permitted.)		
6.2 Position of Inventory plots noted (check with Inv Office if logging permitted.)		
6.3 Present of rare, endangered of restricted flora checked.		
6.4 Presence of rare or endangered fauna checked.		
7) OTHER OPERATIONS 7.1 Logging compatible with: [a] Mining [b] Your knowledge of public utility proposals (eg: dams, SEC lines, roads, Telecom) [c] Apiary sites/forest leases		
7.2 Advance burn required.		
7.3 Roading: - New, upgrading, closures required.		
7.4 Soil movement/No soil movement access requirements defined & demarcated on plan.		
7.5 Washdown points nominated.		
8) ADMINISTRATION 8.1 Nominate Officer who has to prepare the CLM 709.		

Checks by FOIC completed and operation in ..... Block/Compartment is recommended for approval.

..../...../.....
FOIC DATE

Return to Logging Planner by 30 September (Swan and CFR), 30 January (SFR) for no soil movement operations and by 30 December (Swan and CFR), 28 February (SFR) for soil movement operations.

I have reviewed the comments on this checklist and approve the commencement of operations in ..... Block subject to the comments below.

_____

_____

..../...../.....
REGIONAL MANAGER DATE

RETURN SIGNED COPY TO FOIC AND LOGGING PLANNER - FIELD PREPARATIONS MAY COMMENCE.

COUPE SILVICULTURAL REPORT - JARRAH

A. DESCRIPTION

1. District _____ 5. Catchment Zone _____
2. Forest Block _____ 6. Catchment Name _____
3. Compartment No. _____ 7. Land Use Priority _____
4. Coupe Nos. _____ 8. Seven Way Test No. _____

Proposed cutting year _____

Proposed cut over area _____ ha

Cutting will/will not continue in this coupe next year.

B. FOREST CONDITION PRIOR TO HARVESTING

1. Cutting history _____

2. Forest Condition and Structure (Tick the categories which describe the forest before harvesting)

virgin	[ ]	overstocked	[ ]
uniform	[ ]	overmature	[ ]
grouped	[ ]	mature	[ ]
even aged	[ ]	regrowth	[ ]
Other - specify		disease affected	[ ]
_____		insect affected	[ ]
		Other - specify	[ ]

3. Status of Regeneration

Regeneration survey required YES / NO

Stocking _____ SPH over _____ % of area

Survey results _____

4. Comments _____

C. IMPACT ON HARVESTING

1. Silvicultural Objective (refer to Silviculture Specifications Manual)

_____

_____

_____

_____

_____

_____

2. Achieved as the result of commercial operation (see HOCS Print 10)

OBJECTIVE	AREA*
Gap creation	
Shelterwood #	
Thinning	
Selection	
No cutting - poor forest	
- uncut strips	
Other	
TOTAL	

Retained crop trees_____ m^2/ha.
(show a range)

* - To nearest 10 ha.

\# - Buds ARE/ARE NOT plentiful.
- Capsules ARE/ARE NOT plentiful.

D. PRODUCT INTEGRATION

Products as defined for hardwood log delivery note (CLM 823).
Enter volume per hectare.

Product	JSL	JSV	JUR	MSL	MSV	MCH						
Removed												
Available*												

* Where products are present in commercial quantities and are available (ie. not retained as crop trees) but have not been removed due to the lack of a market.

Comments: eg. Product on landing; Poles in NE corner: _____

E. FOLLOW-UP TREATMENT

Required →	Area	Due Date
Completed →	Area	Date

NOTE: This report relates to the required follow-up treatment shown on HOCS print 10. It is to remain in the Current Operations File until all treatment has been completed. Copies of interim annual reports are to be initialled, dated and retained to ensure that areas are not duplicated.

MARKING OBJECTIVE	TOTAL AREA	NIL	CULL/ THIN	SEEDING	SOIL DISTURB.	REGEN. BURN	CULL BANKSIA			
Gap creation					X					
Shelterwood			X							
Full thinning				X	X	X				
Individual crop tree release*				X	X	X				
No cutting										
Other										
TOTAL Required										
TOTAL Completed										

Other work required: _____

_____

* Residual stocking of crop trees _____ S.P.H.

	Initial	Date
Interim Report:		
Final Report:		

CLM 160
Page 3 of 4

F. PROTECTION AND BURNING REQUIREMENTS

Shelterwood burning for existing seed best in _____

Tops burning required before _____

Protection from fire will be required at least until _____

G. POST BURN SHELTERWOOD ASSESSMENT

Date of burn _____ Date of Assessment _____

Stocking standard _____%

Actual stocking _____%

Predominantly seedlings/ground coppice/sapplings

	Y/N	WHEN
Further treatment required: Seeding/Planting		
Coppicing		
Create gaps		

H. CERTIFICATION

Treemarkers: _____ Date _____

_____ Date _____

Master Burning Plan amended: Date _____

Protection Officer _____

Treatments noted: Silviculture Officer _____

DISTRICT MANAGER/FOIC: _____ Date: _____

When all follow-up treatment has been completed this report is to be placed on the District HOCS Record File together with a 1:12,500 scale print showing the work done. A copy of the report and print is also to be given to the regional Inventory officer who visits at the end of the logging year. Until all work has been completed the report and HOCS print is to be retained in the Current Operations File. Initialled and dated interim reports are to be given to the Inventory officer annually.

Attachment 1.1.3
FORM CLM 813 (1992)

POST OPERATION CHECKLIST (ENVIRONMENTAL MONITORING)

To be completed by a CALM officer no less than 12 months and no more than 24 months following the completion (certification) of a logging coupe managed by CALM. At least one checklist to be completed for each completed Pre Operation Checklist (CLM 109).

Operations covered by this Inspection, and date operation certified complete.

OPERATION	DATE CERTIFIED COMPLETE	OPERATION	DATE CERTIFIED COMPLETE
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....
.....	.....	.....	.....

Item Checked	Results of Inspection	Action Required
1. Regeneration		
1.1 Is regeneration adequate on landings?	.....	.....
1.2 Is regeneration adequate on snig tracks?	.....	.....
1.3 Is regeneration adequate on coupe proper?	.....	.....
1.4 General comments	.....	.....
2. Soil and Water		
2.1 Are protection measures (barriers, drainage channels) working effectively?	.....	.....
2.2 Has erosion occurred?	.....	.....
2.3 Is there any unacceptable siltation in streams?	.....	.....
2.4 General comments	.....	.....
	.....	.....
	.....	.....
3. Dieback (Phytophthora)		
3.1 Is there any evidence of introduction and/or spread of dieback?	.....	.....
3.2 Are shunt, landing and snig track barriers still in place?	.....	.....
3.3 Is there any evidence of unauthorised access past these barriers?	.....	.....
3.4 General comments	.....	.....
	.....	.....
	.....	.....
4. Weeds		
4.1 Is there any sign of introduction and/or spread of declared noxious weeds?	.....	.....
4.2 Is there any sign of introduction of other species of vegetation not obviously present prior to logging?	.....	.....
4.3 General comments	.....	.....
	.....	.....

Item Checked	Results of Inspection	Action Required
5. Armillaria		
5.1 Is there any sign of introduction and/or spread of Armillaria fungus?	.....	.....
5.2 General comments	.....	.....
	.....	.....
	.....	.....
6. Insects		
6.1 What is the status of the forest with respect to leaf miner?	.....	.....
6.2 Are there any signs of introduction and/or spread of any other insects harmful to the forest?	.....	.....
6.3 General comments	.....	.....
	.....	.....
	.....	.....
7. Rara Flora		
7.1 Are known populations of declared rare flora on the area safe, secure and in healthy condition?	.....	.....
7.2 General comments	.....	.....
	.....	.....
	.....	.....
8. Fauna Habitat		
8.1 Were sufficient habitat trees and logs retained during the logging operation?	.....	.....
8.2 General comments	.....	.....
	.....	.....
	.....	.....
9. Other		
9.1 What other environmental aspects of the area are worthy of note?	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....
	.....	.....

Date(s) of Inspection: _____

Inspecting Officer: _____

CALM District: _____

Distribution: (1) District Records

(2) Regional Manager

SECTION 1 - PLANNING AND MONITORING

SPECIFICATION 1.2 SEVEN WAY TESTS

1. Before the commencement of any operation in jarrah forest that has the potential to introduce or spread Phytophthora species, the risk shall be assessed by means of a "Seven Way Test". If the operational arrangements fail the Test then the operation cannot be started.

2. Guidelines for the preparation of Seven Way Tests are contained in "The Seven Way Test and Guidelines to its Use" (1990). The Seven Way Test evaluates the following seven factors of a proposed operation.

   * proposed activity
   * vegetation/landform type
   * land use
   * risk of introduction, spread, intensification
   * hazard
   * consequence of infection
   * hygiene required.

3. Seven Way Tests must be prepared for any proposed roadworks or logging operation. Seven Way Tests must be prepared by Districts in conjunction with the preparation of data for the first two years of the five year (or four year) logging plan.

4. The activity eg. roading and/or logging operation covered by an individual Seven Way Test should correspond to a discrete area. Such an area may correspond to a whole forest block, an individual compartment within a forest block, or a smaller area.

5. A Seven Way Test is prepared using form CLM781 and must include accompanying plans at scale 1:50,000 or larger. Attachment 1.2.1 is the updated Seven Way Test form, CLM781 (1993).

6. The levels of authority required to approve Seven Way Tests on different areas of forest are detailed in Administrative Instruction No. 46 (24/9/90). (See Attachment 1.2.2)

SEVEN WAY TEST AND HYGIENE PRESCRIPTION

DISTRICT: TEST NO: DATE:

THE PROPOSED ACTIVITY

THE PURPOSE AND LOCATION

INITIATED BY:

TYPE AND EXTENT OF ACTIVITY (STATE AREAS/DISTANCES/INTENSITY) ATTACH MAPS

ALTERNATIVE STRATEGIES CONSIDERED? YES/NO

LIST THOSE CONSIDERED AND REASONS FOR REJECTION

LAND USE

TENURE.
MANAGEMENT PURPOSE/ZONE:

VALUES	YES	NO	COMMENTS (NOTE SECONDARY USES HERE)	# CONSEQUENCES OF INFECTION
CONSERVATION - ECOLOGICAL - CULTURAL				
PRODUCTION - TIMBER - WATER				
PROTECTION - HARNESSED CATCHMENT - RAINFALL ZONE				
RECREATION				
SCIENTIFIC - RESEARCH - EDUCATION				
LANDSCAPE				
OTHER - Specify				

Guidelines for the assessment of consequences of infection are contained in Section 4 & 5 of the Guidelines for the Use of 7-Way Tests, 1990.

HYGIENE PRESCRIPTION

Dieback Maps:	230mm	Y/N	70mm	Y/N	Roads & creeks	Y/N
	Ground survey	Y/N	spacing	Y/N	Not available	Y/N
Map Quality:	Accurate	Y/N	Doubtful	Y/N	Inaccurate	Y/N

DATE PREPARED/ VERIFIED:

DEMARCATION CATEGORIES (FROM SECTION 5)

Secure dieback-free	Y/N	LPR	Y/N
Dieback	Y/N	HPR	Y/N
Suspect	Y/N	Uninterpretable	Y/N
Not available	Y/N	NEQ	Y/N

SOIL CONDITIONS (FROM SECTION 5) Show areas on plan.
(ie; two options given here):

Soil may be moved by wheels/tracks of vehicles/machinery Y/N
Soil must not be moved by wheels/tracks of vehicles/machinery Y/N

ACCESS ROUTES (Show on plan)

Soil movement on wheels/tracks of vehicles/machinery permitted: Y/N

Soil movement on wheels/tracks of vehicles/machinery not permitted: Y/N

OPERATIONAL SEGREGATION	DETAILED METHOD
- Sub-catchment segregation	Y/N
- Split phase in time	Y/N
- Physical separation	Y/N
- Not applicable	Y/N

Vehicle Cleanliness: _____

Supervision: _____

WORKING ARRANGEMENT DOCUMENTS

Management Plan	Y/N	Job Prescription	Y/N
Interim Protection Plans	Y/N	Manual of Hardwood Logging	Y/N
Dieback Hygiene Manual	Y/N	Other (Specify)	Y/N

DRA PERMIT REQUIRED: YES/NO

PERMIT NUMBER: EXPIRY DATE:

MONITORING ARRANGEMENT:

HAZARD, ACTIVITY, HYGIENE, CATEGORY, RISK - SUMMARY OF AREAS

ACTIVITY	EXTENT (HA/KM)	HYGIENE CATEGORIES	EXTENT (HA/KM)	AREA PUT AT RISK	VEGETATION LANDFORM	EXTENT (HA)	HAZARD RATING	SOIL MOVEMENT ON WHEELS/ TRACKS OF VEH/MACHINES PERMITTED? YES/NO
TOTAL			TOTAL					

EVALUATION

LEVEL OF APPROVAL REQUIRED:

APPROVALS AND RECOMMENDATIONS: (Signature & Date)

District Manager _____

Regional Manager _____

Div. Manager Operations _____

Manager Env Protection _____

Director National Parks _____

Dir Nature Conservation _____

ALTERATIONS AND ENDORSEMENTS: (Signature & Date)

DEPARTMENTAL PROCEDURES FOR THE APPROVAL OF 7-WAY TESTS

The table below sets out the Approving Officer for the 7-Way Tests applicable to the various tenures of land managed by the Department of Conservation and Land Management.

A Policy decision may still be required for certain 7 way tests for operations without precedent or having unusual circumstances. Examples would be where other agencies are concerned, where several districts or regions are involved such as SEC line maintenance projects, large scale mineral exploration proposals, or projects considered to pose severe hygiene risks.

Such proposals will still be referred by the Regional Manager to Environmental Protection Branch. Approval will either be given by the Manager, Environmental Protection Branch or, where appropriate, referred to the Corporate Executive.

District Managers should encourage staff to consider the 7-WAY TEST as a check list for all forest operations involving a hygiene risk. This does not mean that a written 7-WAY TEST is necessary in every case where established hygiene guidelines and prescriptions are available for routine operations. However, the guidelines and working drafts should be used as a training medium and be filed for future evaluation.

Regional Leaders (Environmental Protection) and Environmental Protection Branch staff will still be available to provide guidance, training and as a point of referral in the first instance.

This decision to delegate authority must not be taken to imply any relaxation of hygiene standards for operations on CALM land.

(Administrative Instruction No. 46 24 Sept. 1990).

Area Involved	Approving Officer	Remarks
1. State Forest outside Disease Risk Area.	District Manager	Separate file to be kept at District office for perusal by R/L Environment Protection and/or Environment Protection Branch Staff.
2. State Forest within Disease Risk Area.	Regional Manager (Recommendation by R/L Environmental Protection)	Separate file to be kept at Regional office for perusal by Environmental Protection staff or Policy Review Group
3. Parks and Reserves or any area where timber production is not a priority land use:		
3.1 Existing programs	District Manager	Kept on same file as 2 above.
3.2 New programs	Regional Manager	

SECTION 1 - PLANNING AND MONITORING

SPECIFICATION 1.3 ISSUE OF QUARANTINE ENTRY PERMITS

1. No vehicle, truck or logging machine may enter a quarantine area (Disease Risk Area) without a permit signed by a Forest Officer. This includes vehicles and trucks driven by CALM personnel.

2. All vehicles/machines operating inside a quarantine area must carry a quarantine entry permit at all times, and be prepared to show the permit to a Forest Officer on demand.

3. In situations where a number of vehicles/machines, belonging to or associated with a single logging contractor, need to enter a specific quarantine area, the local CALM District may issue a single quarantine entry permit to that logging contractor. A copy of this permit must be kept in every vehicle/machine, belonging to or associated with that logging contractor, that enters the quarantine area.

4. The driver or operator of every vehicle/machine entering quarantine under permit must be familiar with the conditions printed on the permit document.

SECTION 2 - ROADING

SPECIFICATION 2.1 ROAD PLANNING

PART A - HARDWOOD ROADING

1. The responsibilities for planning of hardwood forest logging roads are included in the listing of "Responsibilities for Logging Roads" below :

RESPONSIBILITIES FOR LOGGING ROADS

TASK	RESPONSIBILITY OF	ACTUAL WORK DONE BY	IDEAL TIMING
1. Planning 1.1 Nomination of major road alignments, after considering other roading requirements (eg. recreation, fire control, disease)	Regional Manager	Regional Roading Officer, after discussion with relevant District, Timber Supply Branch, Environmental Protection Branch	Logging Year minus 2
1.2 Nomination of "in coupe" road alignments	District Manager	Roading contractor and District Manager, after discussion with logging/haulage contractor	Logging Year minus 1
1.3 Nomination of class of roads (ie, major or minor) and whether roads are for (i) dry soil haulage only or (ii) all weather haulage, during consideration of overall logging plans	Regional Manager liaising with District Manager and logging/haulage Contractor	As in 1.1	Logging Year minus 1
2. Writing of standard roading specifications, ie, clearing widths, gradients, cambers, super-elevations drainage, hygiene, etc	Regional Manager	Regional Roading Officer, after consultation with logging contractors and experienced CALM staff	Logging Year 2 minus 2
3. Selection of final road alignments in field	District Manager	District staff with assistance from Regional Roading Officer	Logging Year minus 1
4. Nomination of gravel sources	District Manager	District staff	Logging Year 1 minus 1

TASK	RESPONSIBILITY OF	ACTUAL WORK DONE BY	IDEAL TIMING
5. Preparation of annual timetable for roadworks, including timetable for calling of tenders. Works to be combined or split as required in interests of efficiency	Regional Manager in consultation with Manager Timber Supply Branch	Regional Roading Officer in consultation with District & Regional Managers.	Logging Year minus 1.5
6. Preparation of documents for calling of tenders	Manager Timber Supply Branch and/or Regional Manager	Timber Supply Branch Contracts Officer and/or Regional roading officer	Logging Year minus 1.5
7. Approval of tender documents and advertising	Director Operations Division OR Regional Manager (as per circular 10/88)	Director Operations Division and Regional Manager (as per Contract Tender Circular 10/88)	Logging Year minus 1.5
8. Awarding of tenders	As above	As above	Logging Year minus 1.5
9. Progress checking of work to ensure conformity with environmental aspects and Engineering standards	Regional Manager District Manager	District staff with assistance from regional or specialist staff as required	Logging Year minus 1
10. Measure completed works, sign dockets authorising progress payments	District Manager	District staff	Logging Year minus 0.5
11. Checks on road work quality	District Manager	Regional Roading Officer and District staff	Logging Year minus 0.5
12. Road Maintenance	District Manager	Either Maintenance Contractor or CALM operations	Logging Year

2. The relevant Regional Logging Planning officers are responsible for the preparation of rolling Short term (two year), Medium term (five year) and Long term (15 year) roading plans for each supply area :

2.1 Short Term Plan - on 1:25,000 scale, showing incoupe roading requirements.

2.2 Medium Term Plan - on 1:50,000 scale, showing major haul road requirements.

2.3 Long Term Plan - on 1:100,000 scale, showing likely requirements for major haul roads.

PART B - SOFTWOOD ROADING

1. Roading for softwood logging must be integrated with roading for hardwood logging whenever possible. Thus the principles in Part A of this specification will apply where applicable.

2. In addition, each District is responsible for the preparation of an annually updated five year programme of proposed road construction together with estimated costs. This plan must be prepared after consultation with the Regional Softwood Logging officer. The plan will generally be based on the expectation that logging roads will be required for the first thinning of plantations when they reach approximately 10 to 12 years of age.

3. After preparation of annual roading plans, the Regional Softwood Logging officer and the District representatives will amalgamate the Districts' submissions and set priorities for work to be done, up to the level of finance available each year.

Each Region will then submit its proposal to the Senior Procurement Officer - Softwood for setting of priorities and inclusion in annual estimate preparation.

4. Approved road works will normally be carried out by contractors. The District Manager must ensure that contractors are given adequate time and that specifications for the work comply with standard instructions for road contracts. A higher standard is required for roads required for winter use. For details on softwood plantation road standards refer to Section 5 of the Pine Management Guide.

5. Whenever possible, roadworks should be completed one winter prior to proposed logging activities. If it is necessary for roads to be used for winter operations immediately after completion, logging operations must then be planned so the road is "run in" byy log trucks. Any weak spots exposed, prior to the onset of winter rains, will then need to be strengthened.

SECTION 2 - ROADING

SPECIFICATION 2.2 ROAD SELECTION

PART A - HARDWOOD

1. The responsibilities for planning of log haul routes is covered under Spec. 2.1. Using this information, and subject to Seven Way Tests, the precise alignment of proposed logging routes is determined.

2. Guidelines to be followed in selecting logging routes include:

   * use low profile roads, especially in jarrah forest

   * avoid stream zones, except for stream crossings

   * avoid new roading unless required to protect dieback-free forest

   * use roads in dieback-affected forest in preference to roads in dieback-free forest. Where roads in dieback-free forest must be used, minimise the crossing of dieback categories and minimise the areas of forest placed at risk.

   * where consistent with dieback hygiene practices, and economics, use systems of one-way roads.

3. The responsibility for the exact alignment of proposed new roads is covered under Spec. 2.1.

4. In instances where proposed new roads intersect Shire or MRD roads, Shire or MRD engineers must be consulted.

PART B - SOFTWOOD

Refer to Section 5, Pine Management Guide ("Engineering").

SECTION 2 - ROADING

SPECIFICATION 2.3 ROAD CONSTRUCTION

PART A - HARDWOOD

1. The responsibility for road construction lies with CALM. The actual work of road construction is done by companies contracted to CALM.

2. Road construction must be carried out in accordance with an approved 7-Way Test.

3. Standard Specifications for new roads and upgrading of existing roads are listed in the table below.

   (Note: these specifications may be subject to amendment or alteration in particular roading tenders or particular areas of the South West.)

	Major Haul Roads		Other Roads Including InCoupe Roads	
	For dry soil use	For moist soil use	For dry soil use	For moist soil use
Minimum Clearing width	14m	14m	7m	7m
Road Formation width	8m	8m	4m	4m
Gravel thickness	Nil or as required	min 15cm	Nil or as required	min 15cm
Culvert spacing	see (a) next page	see (a) next page	see (a) next page	see (a) next page
Culvert size	see (b) next page	see (b) next page	see (b) next page	see (b) next page
Table drain depth	20cm	20cm	10cm	20cm
Major stream crossings	See (c) next page	See (c) next page	See (c) next page	See (c) next page
Off-shoots	See (d) next page	See (d) next page	See (d) next page	See (d) next page
Maximum grade	7^{o}	5^{o}	10^{o}	8^{o}
Curves - recommended radii should be > (m)	350	200	350	200
Design speed km/hr	80	60	80	60

	Major Haul Roads		Other Roads Including InCoupe Roads	
	For dry soil use	For moist soil use	For dry soil use	For moist soil use
Stopping Sight Distance to object (from 1.15m eye level to 0.2m object) (m)	115	75	75	115
Stopping Sight Distance to another oncoming vehicle (from 1.15m eye level to 1.15m object) (m)	160	150	160	150
Sight Distance to intersection (from 1.15m eye level to 1.15m object) (m)	175	115	175	115

(a) Culvert Spacing:

Culvert spacing depends on:

* grade
* erodibility of soil type
* catchment size
* time of concentration
* return period used in design.

The programme "PROCALC" is available to all Districts (refer Environmental Protection Branch) and can be used to calculate culvert spacing and size for various situations. The table below is a "rule of thumb" approximation that can be used. It should be applied cautiously particularly on highly erodible soils.

Slope	On lateritic gravels	On all other soils
0 - 2°	As Required	As Required
3 - 5°	100m	100m
6 - 10°	50m	50m
11 - 15°	30m	30m
16° +	15m	15m

(b) Culvert size:

* The size of culvert required depends on the anticipated peak flow which is dependent on design return period, rainfall intensity and duration, and time of concentration. Time of concentration is dependant on catchment size and cover conditions and the amount of water already stored in the soil (field capacity). It must also be remembered that under full flow conditions culverts will only run at 1/3 of full capacity due to vacuation at the outlet end.

  The programme "Procalc" is available to all Districts and can calculate the culvert size required in various circumstances. The table below is a "rule of thumb" developed for fully forested catchments and should be applied with caution.

Pipe Diameter (mm)	**Maximum Catchment Size (ha)**
300	36ha
375	56ha
450	80ha
600	144ha
750	244ha
900	324ha

(c) Major Stream Crossing:

* Must be constructed with pipes or a bridge with a minimum design period of 1:50 years. Full earth/log fills are not permitted.

* Borrow areas must not be located within river or stream reserves.

* Water from borrow areas must be directed into silt trap or vegetative filter.

* Fill must be consolidated to minimise erosion of loose soil and risk of slumping.

* Embankments must be left rough surfaced or corrugated and at an angle at least equal to the natural angle of repose for the soil type (see also (e) below).

* Machine activity in the watercourse and disturbance of stream vegetation must be minimised.

* No heaps of debris to be created within 40m of watercourse.

* A compacted, gravel pavement must be created on both sides of a stream crossing (In some specific instances this may have to be sealed.)

(d) Off-Shoots:

* Off-shoots must be < 1.5° fall.

* Off-shoots must be sufficient in number to prevent table drain erosion. Spacing is the same as for culverts [see (a)].

* Off-shoots into dieback-free forest must be approved by the District Manager. These off-shoots should be at the lowest point in the topography.

* Off-shoots must have a level sill outlet into a vegetation filter strip or silt sump, so that water is not directed immediately into a stream.

* Care must be taken when locating off-shoots near stream zones, to ensure adequate vegetation filter to prevent stream siltation.

(e) Cut and Fill Slopes:

The gradient of cut and fill slopes will depend upon the soil type and the amount of established plant growth beside the area to be regraded. The reasons for sloping these banks are:

- to control erosion by minimising soil movement on the slope;

- assist the establishment of new plant cover;

- to make the grade alteration appear as natural as possible.

The following tables are offered as a guide to **maximum** cut and fill slopes. More gentle slopes are desirable.

CUT SLOPE

Material	**Maximum Slope (%)**
Sand	50
Wet clay, loose gravel	66
Loam, ordinary clay	100
Firm tough soil, compact gravelly soil, towards road, tight cemented gravel	133
Solid well-bedded rock	Vertical

FILL SLOPE

Material	**Maximum Slope (%)**
Loose sand and soft clay	25-50
Ordinary earth	66
Loose rock	80
Hand placed rock filling	100

$$\left(\text{Slope \%} = \frac{\text{rise}}{\text{distance}} \times \frac{100}{1}\right)$$

Where there is doubt about the stability of a proposed cut or fill, engineering advice should be sought.

The shoulders of cut and fill slopes should be rounded off so that the profile appears as natural as possible.

4. All road clearing debris must be neatly heaped in natural gaps alongside the road, with due consideration given to the protection of crop trees, and burnt in suitable weather conditions.

5. The location and use of gravel pits must be approved by the District Manager. Gravel for use on roads in dieback-free forest must be obtained from uninfected gravel pits, or as per an approved 7-Way Test. Small stockpiles of suitable road surfacing materials should be established at the time of construction for later use in areas likely to cause problems and for gravel road maintenance.

6. If, during road construction in dieback-free forest, water is required to settle dust or bind the road surface, such water must be treated with sodium hypochlorite at the rate of 1:2000. (See also Specification 5.1, paragraph 3.4).

7. New gravel should be compacted with a vibrating roller prior to use by log trucks.

8. Road signposting must meet the requirements of the TIR Act and conform to MRD and CALM sign manual standards.

9. Road names must be approved by the Department's Geographic names Committee.

10. Appropriately timed rare and endangered flora and fauna surveys must be consulted as advised by specialist CALM staff.

PART B - SOFTWOOD

1. As with hardwood operations, the responsibility for road construction lies with CALM. The actual work of road construction is done by companies contracted to CALM.

2. Standard softwood plantation road specifications are detailed in the Engineering Section of the Pine Management Guide.

SECTION 2 - ROADING

SPECIFICATION 2.4 ROAD MAINTENANCE

PART A - HARDWOOD

1. The responsibility for road maintenance resulting from normal wear and tear lies with CALM. The actual road maintenance work is done by companies contracted to CALM.

2. The cost of any necessary road maintenance resulting from unwarranted damage to roads will be borne by the road user, and may be recouped from the user, as decided and directed by the Forest Officer in Charge.

3. Road maintenance, using earth moving machinery, must conform with an approved 7 Way Test.

4. A road that deteriorates suddenly should not be used until repairs are effected. By-passes must not be constructed to avoid boggy sections of road.

5. A failure in a wet weather road resulting in road closure should be investigated by CALM and relevant Contractor personnel to ascertain the cause and prevent repetition if possible.

6. Roadside scrub clearing must be carried out according to TIR Act requirements.

7. The edge windrow of gravel resulting from maintenance grading operations must be broken frequently to allow water entry to table drains, off-shoots, culverts or intact vegetation.

8. All roads not in use should be signposted as being closed - particularly dry soil access roads.

PART B - SOFTWOOD

1. As with hardwood operations, each District is responsible for the maintenance of roads used by logging contractors. After discussion with the Regional Softwood Logging officer each district must plan the timing of work and extent of maintenance to be done. This maintenance will generally consist of the removal of logging debris from the road and drains, grading the road; repair of culverts damaged during logging and limited patch gravelling where required.

2. Pine logging roads must not remain impassable for any extended period. Logs on roads must be removed immediately, and debris or road damage of a major nature should be removed or repaired so the road is trafficable. This is of particular significance during the fire season.

3. Major through roads must be kept open at all times during the fire season. Logging along these access roads during winter will help to achieve this. It is the responsibility of the FOIC to inform the fire duty officer of any roads which are impassable and to ensure alternative through access exists and is known.

4. Because many plantations are adjacent to dams and reservoirs, or follow major watercourses, the timing and extent of road maintenance is very important. Free water tends to accumulate on and near roads and may increase after logging. One aim of planning logging operations in general, and road maintenance in particular, is to slow the movement of water and dissipate it through vegetation, in order to reduce turbidity.

Logging debris is an ideal filter, and the aim should be to divert water via spoon drains across roads, etc. Debris can be left in drains for a period immediately after logging, but culverts must be clear and exit into vegetation or logging debris whenever possible.

5. Traffic control signs must be displayed along log hauling routes as required by the FOIC or the TIR Act Inspectors. All signs must conform with MRD standards.

6. The contractor will, as a matter of course, heap up a considerable amount of logging debris on adjacent firebreaks. Close liaison and discussion with the contractor will ensure this is done in a manner which assists future protection requirements.

SECTION 2 - ROADING

SPECIFICATION 2.5 GRAVEL PIT MANAGEMENT

1. For the purposes of this specification, the term "gravel" also applies to other road-making materials such as sand, quartz, limestone, marl and rock. These materials are sometimes referred to as "basic raw materials" or "BRMS".

2. Contractors involved in gravel extraction, including CALM logging contractors, are required to work to the guidelines set out in the CALM booklet: "Guidelines for Management and Rehabilitation of Gravel Pits - South West Forest Areas". This booklet is undated but was released in 1992.

   If specific requirements for a given contractor vary from these standard guidelines, such requirements should be included in the particular contract.

3. CALM's policies regarding requirements for leases, compensation, royalties, and approvals, with respect to basic raw materials ex State forest, are contained in Policy Statement No. 2 (revised October 1989) and in Briefing Paper No. 1/93.

4. For basic raw materials extracted from State forest for use on logging roads, there is no requirement for any mining tenement, CALM lease, compensation to CALM, or royalty. Approval for opening of new pits on State forest for logging roads rests with the local CALM District office.

SECTION 3 - SILVICULTURE

SPECIFICATION 3.1 CURRENT SPECIFICATIONS

1. The compilation of silvicultural specifications is the responsibility of Silviculture Branch, Forest Resources Division.

2. A list of current and superseded hardwood silvicultural specifictions follows:

CURRENT SPECIFICATIONS

No	TITLE	ISSUED
1/88	REGENERATION OF TUART FOR CONSERVATION	FEB 88
2/89	TREEMARKING AND REGENERATION IN WANDOO WOODLANDS	AUGUST 89
3/89	TREEMARKING IN JARRAH FOREST AFFECTED BY Phytophthora cinnamomi IN THE CENTRAL AND NORTHERN FOREST REGIONS	AUGUST 89
4/89	REGENERATION IN FOREST AFFECTED BY Phytophthora cinnamomi	AUGUST 89
6/89	LOGGING OF REGROWTH IN TWO-TIERED KARRI STANDS	AUGUST 89
1/90	KARRI REGENERATION SURVEYS	JANUARY 90
3/90	JARRAH REGENERATION SURVEYS	JANUARY 90
1/91	FIRE AS A SILVICULTURAL TOOL IN THE JARRAH FOREST	MAY 91
2/91	TREEMARKING AND SILVICULTURAL TREATMENT IN THE JARRAH FOREST	OCTOBER 91
1/92	KARRI THINNING	JANUARY 92

SUPERSEDED SPECIFICATIONS

1/86	JARRAH THINNING
1/87	JARRAH THINNING AND REGENERATION
2/87	JARRAH SILVICULTURE IN THE PRESENCE OF Phytophthora cinnamomi
1/89	ESTABLISHMENT OF EUCALYPTUS PLANTATIONS
5/89	MAINTENANCE OF HABITAT FOR HOLE NESTERS IN TIMBER PRODUCTION AREAS OF THE JARRAH FOREST
7/89	TREEMARKING AND SILVICULTURAL TREATMENT IN MULTIPLE USE JARRAH FOREST
2/90	KARRI THINNING
4/90	ESTABLISHMENT OF EUCALYPT PLANTATIONS

Copies of current silvicultural specifications may be obtained by contacting the Hardwood Silviculturalist, CALM, Manjimup.

3. For details of all current softwood silvicultural specifications, refer to the latest edition of CALM's "Pine Management Guide" or to the Softwood Silviculturalist, CALM, Bunbury.

4. The decision as to which silvicultural specification to use must be given careful consideration prior to the commencement of treemarking and harvesting. The decision made should be noted by the Forest Officer in Charge of the particular cutting area on any prelogging checklists or coupe plans and, for jarrah operations, on the Coupe Silvicultural Report form (CLM 160).

   All silvicultural work carried out during or immediately after logging must be accurately and promptly recorded on HOCS or POCS sheets.

SECTION 3 - SILVICULTURE

SPECIFICATION 3.2 ADVANCED BURNING

1. "Advanced burning" is the practice of carrying out controlled burning in advance of a harvesting operation. Such burning is ideally conducted one season prior to the harvesting operation.

2. Advanced burning is beneficial to a harvesting operation if the density of scrub is effectively reduced by the burning, allowing easier and safer access for treemarkers and fellers. Advanced burned can also assist Forest Officers in the task of assessing the amount of lignotuberous advance growth present in jarrah forests.

3. Advanced burning must not be carried out in areas of jarrah forest about to be cut, if interpretation for dieback has not been completed. However, if current, reliable dieback hygiene maps are available, advanced burning may be undertaken for reasons of access, safety and silviculture, subject to Specification 5.1, para 5.3.2.

4. As indicated in Schedule 3 of the logging Contracts to Supply, CALM is not obliged to carry out advanced burning according to a contractor's wishes. If CALM cannot carry out advanced burning on areas of forest due to be cut, then any required scrub control ("scrub rolling") is the responsibility of the logging contractor.

SECTION 3 - SILVICULTURE

SPECIFICATION 3.3 KARRI SILVICULTURE

Karri silviculture guidelines and specifications are the responsibility of Silviculture Branch, Forest Resources Division. Existing specifications relevant to silviculture are included in the list under Specification 3.1 of this Manual.

For clearfelling operations the following guidelines apply:

1. Karri Regeneration Method

Regeneration of clearfelled karri areas will, whenever possible, be by the "Karri seed tree method". Regeneration by planting of seedlings or sowing of seed is second priority.

2. Seed Forecasting

Following receipt of the medium term logging plan, areas of karri to be logged must be inspected to ascertain their current and future seed cycle status. (See SFR Operations Manual, Item 4.12, for information about seed forecasting.) The result of the inspection will indicate whether or not the particular coupe will be regenerated by seed trees.

3. Karri Seed Collection

If mature karri seed is available in commercial quantities it is imperative that arrangements be made to pick this valuable resource as soon as possible. If the area is to be cut to seed trees, the seed trees will be marked prior to felling. (See Item 13, SFR Operations Manual)

4. Planning

The sequence of falling operations, location of internal log haul and/or boundary roads, and scrub rolling by contractors during the logging phase, must be well planned. Well located roads can be used for fire management and regeneration, including planting, purposes. The falling sequence can allow the safe burning of portions of completed coupes after logging, and properly supervised scrub rolling during log extraction will allow a more effective regeneration burn.

5. Clearfelling without Seed Trees

Where an area is to be regenerated by hand planting or artificial seeding, the cutting prescription is to remove all merchantable stems within the demarcated coupe.

6. Clearfelling with Seed Trees

6.1 Cutting to Seed Trees

The aim of this operation is to retain and protect trees which will provide a seed source for regeneration.

6.1.1 Seed Tree Stocking:

Seed trees will be retained at a stocking of 4 trees per hectare. This corresponds to a spacing of about 50-60 metres between the boles.

Allowable Variation:

a) Up to 80m in high site quality pure karri stands (2 trees per hectare).

b) Down to 40m in severe fire damaged areas or MK stands (6 trees per hectare).

6.1.2 Seed Tree Specification:

The Seed Tree will be a windfirm dominant or codominant stem with a healthy spreading crown, of a good form and free from hereditary defect such as severe sweep and bends, forking or grain deviations.

Allowable Variation:
Retain any seed source (ie, cull tree) if no Seed Tree meeting the above specification is available at the prescribed spacing. Significant areas devoid of suitable Seed Trees will be clearfelled and planted.

6.1.3 Seed Tree Species:

Seed trees will be karri (and tingle if it is a tingle stand), but marri or blackbutt will be retained, in the absence of a suitable karri, at the prescribed spacing. Retention marking of Seed Trees is required before any trees are cut.

6.1.4 Seed Tree Protection:

Retain any tree which is likely to uproot or damage the crown of a Seed Tree when felled.

6.1.5 Marking Procedure:

Seed Trees will be marked with an orange painted line at head height around the tree, or an orange painted "S" on three sides. Temporary marking using orange flagging tape is permitted.

Additional Seed Trees may be retained during the initial cut to provide for losses due to windthrow or falling damage if there is reason to believe that this will be a problem.

6.2 Regeneration Burning:

Approximately 2 weeks prior to a regeneration burn in karri seed tree areas, it is essential that branches from retained trees be removed to allow sampling of the viability and numbers of seed per capsule.

The release of seed from capsules following the regeneration burn depends on:

* Time of year burnt
* Maturity of seed
* Intensity of burn
* Size, health and vigour of seed trees
* Time elapsed since logging commenced (exposure of crowns to wind and weather)
* Soil dryness index
* Weather conditions (especially temperature and rainfall) leading up to and during burn
* Viability and number of seeds per capsule.

6.3 Removal of Seed Trees:

The objective of the operation is to remove Seed Trees with the minimum of damage to seedlings and soil.

6.3.1 Seed trees from areas which are burnt in the summer months (December to March inclusive) will be removed no sooner than 5 weeks after the burn to allow seed shed throughout the warm summer period. Autumn regeneration burns may allow the removal of Seed Trees within 3 weeks of the burn following approval by R/L Forest Resources. Seed Trees shall be removed within 2 years of the regeneration burn. Any extension to this period must be requested in writing and may only be approved by R/L Forest Resources.

6.3.2 In some cases the logging contractor may be left to complete the removal of Seed Trees with minimal supervision from Departmental staff. The Forest Officer will be mainly involved in monitoring utilisation and ensuring that environmental standards are maintained.

6.3.3 The primary cause of damage to regeneration and soil is uncontrolled movement by log hauling machines. The Forest Officer is to decide, in conjunction with the Contractor's bush foreman, the pattern of snig tracks and landings to be used. No <u>new</u> major snig tracks or log dumps will be constructed without authorisation from the Forest Officer.

6.3.4 The logging crew will be instructed by the Forest Officer with regard to the following points:

a) Maximum use of existing snig tracks should be made to minimise damage to soil and regeneration.

b) No unnecessary clearing of ground debris en route to logs. Logs blocking snig tracks to be cut and lifted, not pushed into regeneration.

c) The selection of routes off main snig tracks should aim to minimise damage to regrowth.

d) Machines will be reversed into butts and crowns at all times.

e) No rolling or skidding of logs is permitted to enable hook-up.

f) Where a log has to be moved it must be lifted and pivoted on the crown end.

6.3.5 Seed Tree removal will be carried out only under dry soil conditions. A nominal period from 15 November to 31 May each year is set and the operation may be suspended during wet weather during this time. Extensions to this period may be negotiated and requests will be in writing.

6.3.6 The Forest Officer will assess the likely impact of extracting small chiplogs from Seed Tree crowns. He may decide to leave merchantable logs in order to minimise soil disturbance.

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.1 COUPE DEMARCATION

1. Coupe boundaries must be identified prior to commencement of cutting using white painted crosses facing into the coupe. Unless already nominated on the approved logging plan a coupe boundary should correspond to (i) the boundary of a single "macro catchment" and/or (ii) roads, watercourses, reserve boundaries or dieback boundaries low in the profile. Accurate location of coupe boundaries is vital particularly when clear felling is involved. A known point (theodolite reference tree, surveyed road junction, private property boundary, etc.) should be used to locate a precise geographical location. Aerial photos will assist. Roads and other features plotted on Departmental maps cannot be assumed to be accurate.

2. Sub coupes, when applicable must be identified prior to cutting using red flagging tape, increasing to three red tapes on corners and defined junction points. Sub coupe boundaries must correspond to boundaries of individual, self-draining "Micro catchments" within a coupe, and/or dieback hygiene plan boundaries.

3. Sensitive boundaries including stream zone, road zone and amenity reserve boundaries must be identified prior to cutting in the same way as coupe boundaries, that is with white painted crosses facing the cutting area. Diverse ecotype zones will be similarly marked where appropriate. The exact location of boundaries of stream, road and amenity reserves is as decided by the Forest Officer in Charge, using the following guidelines:-

3.1 River and Stream Zones

General:

- The purpose of river and stream zones is to protect the water body from sedimentation, siltation and turbidity caused by the erosion of soil from disturbed land surfaces. The undisturbed vegetation of the reserve reduces the energy of overland flows resulting in the deposition of undissolved solids before they enter the water body.

  Stream zones also provide a wide variety of fauna habitat and act as corridors for fauna movement and recolonisation of disturbed areas.

  They also provide a softening of the visual impact of logging operations.

- The width of the river or stream zone is dependant on vegetation type, slope, susceptibility of the soil to erosion, the intensity and duration of rainfall events and whether the watercourse is within a harnessed catchment.

- A river or stream zone is measured from the outside edge of the stream zone vegetation.

Native Hardwood Forests:-

- Width of river or stream zones must be varied according to the table below.

Stream Order	Width Either Side (approx. m)	Total Width (approx. m)	Minimum Width Either Side (m)
First	30	60	20
Second	30	60	20
Third	30	60	20
Fourth	75	150	50
Fifth upwards	200	400	100

Softwood or Hardwood Plantations:

In plantations due for clearfelling and subsequent establishment of the second rotation, the original plantation area must be maintained, unless visual resource management considerations deem otherwise. For plantations within 3km of a reservoir, design of second rotation plantations should involve consultation with management of the local WA Water Authority Office. (Refer also to the Department's Afforestation Manual.)

3.2 Road Zones

General:-

- The purpose of road zones is to provide undisturbed forest vistas on major roads and to act as habitat and movement corridors for fauna.

- Some thinning may be allowed within road zones, as directed by the Forest Officer in Charge.

- Fixed width road zones are only applicable in the Southern Forest Region on what are known as "Level 1" and "Level 2" roads. (See Att. 4.1.1)

Width of Road Zones:-

- For Level 1 roads the width of the road zone must be at least 200m on both sides of the road. For Level 2 roads the minimum width must be at least 100m on both sides of the road. For all other roads in State forest, any adjacent harvesting is to be carried out in accordance with appropriate VRM principles.

Elsewhere:-

- VRM principles are to be applied.

3.3 Amenity Reserves

- These reserves should be demarcated to screen certain areas such as recreation sites from logging operations. A "line of sight" reserve may be necessary on steep slopes. Some selective cutting may be allowed within amenity reserves, as directed by the Forest Officer in Charge.

3.4 Diverse Ecotype Zones

- These zones should be demarcated to protect the unusual ecotypes and the transitional vegetation which surrounds them. These include heathland, sedge and herb vegetation, rock outcrops, swamps, lakes, wetlands, low shrubby woodlands and pure marri.

  The boundary of these zones should be based as far as possible on ecological characteristics with transitional vegetation (ecotones) kept undisturbed for a distance of up to 50m from the edge of the feature.

4. Coupe demarcation is the responsibility of the Forest Officer in Charge. However, as much of this task as possible is to be delegated to the contractor provided the contractor has suitably qualified staff.

5. Demarcation of Karri Regrowth Permanent Increment Plots.

Over 230 permanent increment plots are located throughout the karri forest. These plots range in size from 30m by 30m to 70m by 70m and are identified in the field by five star pickets, one at the plot centre and one at each corner. All trees within the plot are tagged. Forest Officers and logging contractors must take care not to disturb these plots. Forest Officers are required to exclude these plots, and a suitable buffer zone of at least 25m width, from any cutting, using painted white crosses. Further information should be obtained from Manjimup Inventory Section.

LEVEL 1 AND LEVEL 2 ROADS

Level 1 Roads:

Big Tree Road*
Beardmore Road
Boat Landing Road
Boorara Road*
Burma Road
Centre Road*
Channybearup Road
Chesapeake Road
Chindalup (Tone) Trail*
Collins Road
Coronation Road
Cosy Creek
Diamond Tree Road*
Davidson/Graphite Road
Deeside Coast Road
Dog Road*
Donnelly Mill Road
Donnelly Drive*
Eastbourne Road*
Eastbrook Road*
Glauders Road*
Kin Kin Road*
Kurandra Road*
Middleton Road
Middlesex Road*
Mockerdillup Road*
Mordalup Road
Mt Frankland Road
Muir Highway
North Pemberton Road*
Nornalup Road*
Orchid Road
Pemberton-Northcliffe Road
Pemberton-Northcliffe Tramway*
Perup Road
Pine Creek Road*
Peppermint Grove Road*
Ralph Road*
Ritter Road*
River Road*
Rainbow Trail*
Sears Road
Seven Day Road
Smith Road*
South West Highway
Spencer Road*
Stirling Road
Thompson Road
Tramway Trail
Vasse Highway
Wheatley Coast Road

Level Two Roads:

Boronia Road*
Boyup Brook/Cranbrook Road
Corballup Road
Grays Road
Lewis Road*
Malimup Track*
North Walpole Road
Pozzi Road*
Seaton Ross Road*
Scott Road*
Weld Road*
West Palgarup Road*

* Roads not included in the previous Road Zone System.

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.2 FELLING (INCLUDING TREE MARKING TECHNIQUES)

PART A - HARDWOOD

1. Fellers' Blocks

- Control of felling is by the system of fellers' blocks i.e. the allocation of areas of forest (known as "fellers blocks") in approved coupes or subcoupes to individual registered fellers or individual tree harvesting machines. The areas must be demarcated by white tape prior to commencement of cutting.

- Fellers' blocks must be demarcated by the contractor's foreman or supervisor.

- The size and shape of a feller's block can vary, depending on the quality of forest, terrain, access or other factors, but must not be greater than about two weeks of cutting for the individual feller or tree harvesting machine.

- Normally, all products in a feller's block will be extracted to a single landing, on the edge of that feller's block.

  A feller should not be allocated more than two feller's blocks at any one time. Unless approved by the Forest Officer, a third feller's block should not be allocated until cutting in one of the first two blocks is completed.

2. Tree Marking

Trees to be removed from an area may be indicated to fellers by marking either those trees to be removed or those trees to be retained as crop trees. The Forest Officer in Charge will decide which method is to be used depending on the type of bush being cut and other practicalities. Once this decision is made, the tree marking method must not be changed within an individual coupe.

Tree marking will normally be carried out by Forest Officers. Occasionally, however, the Forest Officer in Charge may allow felling to take place without tree marking. This may occur in "first thinning" of young, even-aged regrowth stands, and in "clear felling" areas. In these cases the FOIC must ensure that:

i) silvicultural objectives are not compromised and

ii) protection of retained crop trees meets standards as per Specification 5.4.

2.1 Tree marking individual trees for removal: individual trees may be marked for removal using an axe only. Paint or tape is not acceptable.

Trees marked for removal with an axe must be blazed on two sides at a comfortable height and toemarked to indicate the desired direction of fall.

In areas where trees are marked for removal, no other trees may be felled.

2.2 Tree marking individual trees for retention: individual trees may be marked for retention using orange paint only.

Trees marked for retention with paint must be painted at least 1.5m above the ground, with a band about 4cm wide completely around the tree.

In areas where trees are individually marked for retention, fellers must cut any other tree containing usable produce under the terms of the relevant contract.

2.3 Tree marking groups of trees for retention:

A group of trees may be marked for retention by using double white painted brands around trees along the perimeter of the group. At least one tree in every 10m of perimeter must be marked. The logging supervisor must be advised by a Forest officer of areas containing groups marked for retention.

2.4 Tree markers must make regular sample counts to determine crop tree stocking during tree marking.

2.5 Trees leaning into road, stream or amenity reserves must not be felled unless specifically marked for removal by a Forest Officer using a tree marking axe.

3. Scrub Rolling

Scrub rolling prior to felling, if necessary, must be carried out by the logging contractor. Soil disturbance during scrub rolling must be minimised. Scrub should be rolled flat rather than bladed out. Limited blading out is acceptable close to trees to be felled. Dieback hygiene requirements must be observed during scrub rolling.

4. Stump Height

Stumps must be as low to the ground as possible, provided safety is not compromised. For a solid mature tree, the stump should not be higher than approximately 45cm above the ground at the base of the tree on the uphill side. 45cm is approximately "knee height". For solid regrowth trees, including trees cut for poles or mining timbers, the stump should not be higher than approximately 7cm above the ground at the base of the tree on the uphill side.

5. Branding of Logs and Stumps

In hardwood operations, all stumps, and all logs prepared by a feller, must be branded with the feller's brand immediately after cutting.

6. Safety

All fellers must comply with safety requirements as summarised in the booklet: "Safety Code for Western Australian Logging Operations", published by the Forest Industries Federation (WA Inc).

PART B - SOFTWOOD

1. Whenever possible, the same treemarking rules applicable to hardwood should be used in softwood logging operations. In particular, only orange coloured treemarking paint should be used.

2. Tree markers must make regular sample counts to determine stocking, both before and during treemarking.

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.3 EXTRACTION

PART A - HARDWOOD

1. Extraction (or snigging) of logs may be controlled by the system of fellers' blocks (or sub coupes) in the same way as felling. That is, an individual logging unit may be allocated two fellers's blocks (or sub coupes) and may not be allocated a third until extraction in one of the first two is completed.

2. Snig track patterns in individual faller's blocks or sub coupes must be planned, and may be physically demarcated, if necessary, by the contractor's foreman or supervisor. Snig tracks should adopt a herringbone pattern leading downhill whenever possible. Snig tracks may be indicated using a) red and white flagging tape together on individual trees or bushes, or b) axe blazes on trees or bushes.

3. When applicable the location of landings must be planned and marked at the time of road construction. This allows road drainage to be diverted and the avoidance of large table drains and batters which make loading away from landing sites difficult. It allows the landing to be located away from any disturbance caused by roading activity and so avoids cross contamination from road to landing of dieback.

4. Landings must, whenever possible, be created in existing gaps within the forest. Clearing debris must be neatly heaped to the side or rear of landings, at least 5m away from retained crop trees. For landings to be used in wet weather conditions, any topsoil present must be neatly stockpiled to one side to avoid mixing with subsoil horizons.

5. Whenever possible landings should be located on old landings from past logging activities, subject to dieback interpretation or natural openings.

6. Landings should be kept as small as possible and only one landing allocated to each fellers block or sub-coupe.

7. Landings must be planned and marked (using the same techniques for snig tracks) by the contractor's foreman or supervisor, subject to approval by the Forest Officer in Charge.

8. <u>Split phase logging:</u>

In jarrah forest not known to be infected with dieback disease, extraction of logs must conform to the techniques of "split-phase logging". This separates the snigging phase of logging from the loading and hauling phase. This is done to minimise the risk of introducing dieback fungus into a sub coupe from material that may be dropped at a landing by log trucks or other vehicles. There are four different techniques in "split-phase logging". These are, in recommended order of preference:-

8.1 Separation of extraction and loading in time: in this technique, extraction in a sub coupe or faller's block must be completed before loading and hauling commences. That is, once loading and hauling commences, a skidder must not return to the sub coupe or faller's block and all snig tracks must be blocked at the landing. If a skidder is required to return, it must be cleaned down before each trip into that sub coupe or faller's block. Prior to each entry a forest Officer will require a machine to be inspected by an appropriately qualified person. (See Spec. 5.1, para 2) In this technique, a log barrier must be positioned at the front of the landing during skidding. When skidding is completed, this front barrier must be removed and a rear barrier established.

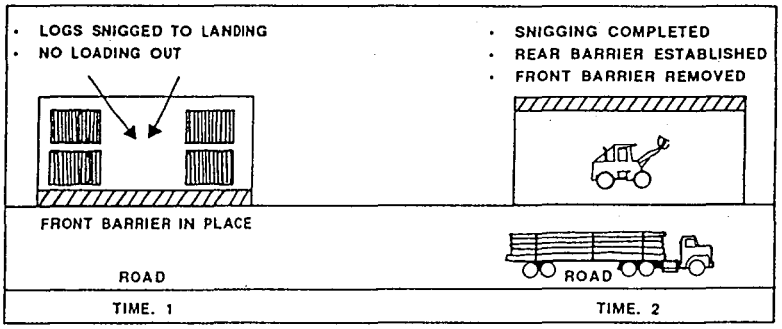
Advantages:

- very little chance of introducing disease to the sub coupe
- can be used under "with soil movement" conditions
- planning of trucking requirements is well organized.

Disadvantages:

- landings can be large and/or numerous to cater for all products produced.
- produce can degrade on landings due to exposure.
- soil damage can be severe.

SPLIT PHASE IN TIME



8.2 Use of a stationary loading machine: in this technique, a stationary machine, such as a "heel-boom loader" is used to load trucks. Such machines are set up on the roadside below a landing, thus avoiding the transfer of any soil onto the landing. Skidding and loading can take place concurrently. A barrier to separate the area on which trucks can travel from the area on which the skidder works is required.

Advantages:

- no chance of cross contamination from road to landing or landing to coupe.
- landings can be relatively small as products are loaded out as they are skidded in.
- landings do not suffer very much soil damage.
- can be used under "with soil movement" conditions.

Disadvantages:

- log size is limited to loader capacity.
- Requires a specialised machine for loading.
- loading machine is not readily transported between landings at short notice.
- landings are small due to reach of the loader and may need to be numerous.

8.3 Separation of extraction and loading by a physical barrier at the rear of a landing: in this technique, a physical barrier such as a log not less than 400mm in diameter is situated at the front and rear of the landing, and logs skidded to this landing are pushed, or preferably lifted over the barrier onto the landing proper. The skidder and loader are thus physically separated, avoiding the risk of transfer of innoculum, brought in by log trucks, into the coupe. The barrier must be substantial and secure so that it does not move forward during use. Skidding and loading can take place concurrently.

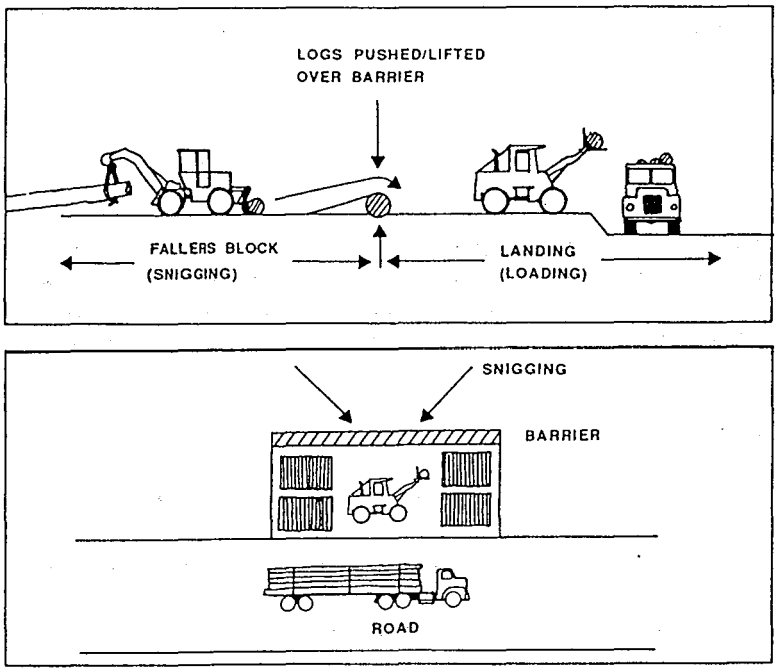
Advantages:

- no chance of contaminating the coupe from the landing.
- landing size is relatively small.
- one loading machine can be shared between concurrent landings.
- can be used under "with soil movement" conditions.
- loader is not a specialised machine.
- maximises skidding time.

Disadvantages:

- requires two machines per coupe.
- landing can become infected from the road.
- soil damage is likely to be more severe due to mobile loader.
- can pose a danger to chainsaw operator if working on landing.
- skidding machine has to be able to push or lift logs over the barrier. This may require specialised equipment.

REAR BARRIER



8.4 Separation of extraction and loading by a physical barrier at the front of a landing: in this technique, a physical barrier such as a log not less than 400mm diameter is placed at the front of a landing, adjacent to where log trucks are parked for loading. This barrier separates the loader and skidder from the path of the log trucks, thus avoiding the risk of transfer of soil, brought in by the log trucks, into the sub coupe. Skidding and loading can take place concurrently.

The front barrier technique is the least preferred of all split phase logging techniques. When it is used, the barrier must not be allowed to shift from the landing onto the road or road batters and soil must not move over or around the barrier.

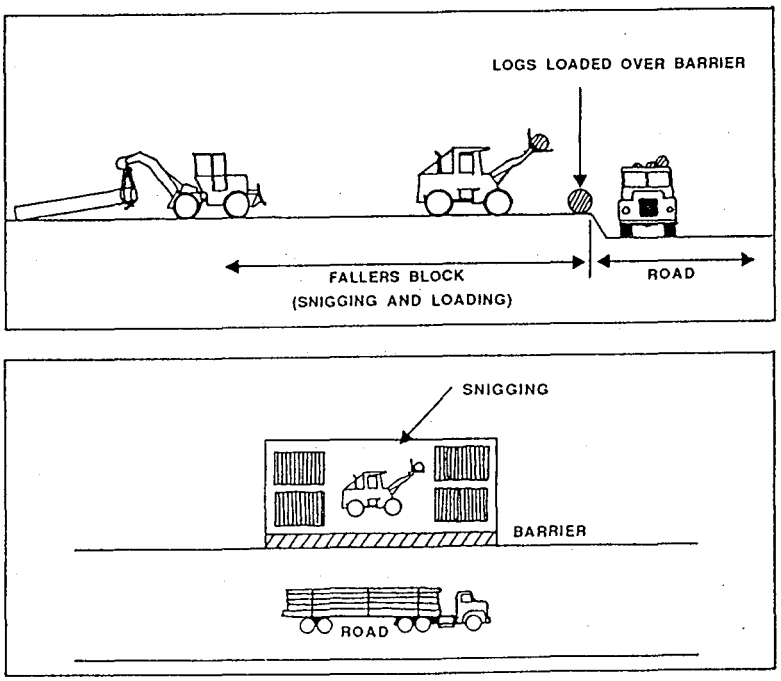
Advantages:

- cheap to implement.
- only one machine required per coupe.
- landing size relatively small.
- soil damage can be less severe as landings are worked in dry soil conditions only.

Disadvantages:

- can only be used in "no soil movement" conditions.
- movement of barrier onto road or road batters is possible resulting in cross contamination from road to landing and coupe.
- loading over a barrier is sometimes difficult.
- washdown required every time the machine re-enters the landing.

FRONT BARRIER



9. Wherever there is a risk of transport of soil from infested to uninfested areas (see Specifications 5.1 paragraph 3.2) extraction can take place only when the machinery used does not transport or move soil or vegetable matter. This means that the tyres of skidders must not pick up and move any soil or vegetable matter. If soil becomes wet following rain, and begins to stick to machinery tyres, the skidding operation must cease until the soil dries sufficiently. The decision as to when skidding ceases and recommences is the responsibility of the Forest Officer in Charge. (See also Spec. 5.1 para 2)

   In most cases the FOIC will delegate this responsibility to the forest representative. The FOIC may also delegate this responsibility to the contractor's supervisor or bush foreman if such person is appropriately qualified.

10. In dieback-infected forest, the extraction operation is subject to the rules detailed in Specification 5.2 (Protection of Soil).

11. At the completion of extraction, all major snig tracks in dieback-free forest must be blocked by a physical barrier such as a log of at least 400mm in diameter.

12. No extraction machine may enter a road, stream or amenity reserve without the specific approval of a Forest Officer.

PART B - SOFTWOOD

1. Conventional Extraction

   The shortwood system of logging using conventional flat terrain equipment is used in most CALM controlled softwood logging operations. Under this system trees are delimbed and cut to length at the stump and extracted to plantation roadside using 6 or 8 wheel forwarders. The main advantages with the shortwood system over the alternative long length or whole tree system using skidders for extraction are:

   - minimal or no landings, important for steep country and forest adjacent to reservoirs.
   - minimal damage to remaining crop, important in thinning operations.
   - maximises loading efficiency of trucks, and
   - less sand and stones imbedded in the bark, which reduces saw damage.

2. To facilitate extraction and minimise damage to the remaining stems, a fifth row outrow is used whereby each fifth row is removed and the bays in between thinned.

3. Felling, delimbing and cutting to length is either done manually or mechanically. The manual system is more concentrated in mature stands for Third Thinning or Clear Felling.

   Mechanical feller bunchers include John Deere 743, Kockum 880 or Bell Logger.

   Mechanical delimbing and cutting to length include machines such as the Kockum Processor, John Deere 743, Logma or Denis stroke delimber.

Skyline (Cable) Extraction

1. On terrain with slopes which exceed 14° to 16° conventional equipment cannot be used and skylines are used instead. Trees are felled manually and extracted in multiples of log lengths by skyline. The skylines used in WA are in fact high lead systems with the logs dragging on the ground.

2. Logs are extracted to roadside, stacked in log lengths using a mounted knuckleboom loader and shifted by forwarder to the nearest road accessible by truck.

3. This type of operation requires rather different forward planning to conventional methods of extraction, even though a 5th row outrow arrangement still applies.

4. CALM officers with previous experience in skyline logging must be involved.

5. The ideal situation is to extract approximately half the trees in each direction (ie. uphill and downhill). The ideal extraction distance for this type of machine is between 150-250 metres. An inspection of the area to be logged and the measurement of distances through the longest axis must be part of the planning.

6. The contractor's representative, or the Skyline operator should take part in the inspection. The aims should be to complete the area without constructing internal tracks.

7. If the construction of internal roads becomes necessary, these should be planned well in advance. Internal roads will be constructed for summer operations only, and will be at the minimum standard to allow access for the Skyline unit and forwarder.

8. Internal roads or tracks should nearly follow the contour to maintain as flat a footing as possible. It may be necessary to costruct short shunts and pull the material on a fan layout.

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.4 LOADING AND DELIVERY

1. In jarrah forest not known to be infected, loading operations must conform with the techniques of "split-phase logging", described in Specification 4.3.

2. The log hauling route or routes used on State forest must be approved by the Forest Officer in Charge. Traffic control signs must be supplied and erected along these routes by the contractor as required by the Forest Officer in Charge or the TIR Act (DOSHWA) Inspectors. All signs displayed must conform with M.R.D. standards. A list of standard signs, and their use follows:-

   a) **"TRUCKS ENTERING"** - 15cm letters, black on yellow background. These signs must be erected on major roads on either side of the junction of the major road and a lesser road used by log trucks. The signs must be removed immediately after the operation is complete, or if there is a break in carting exceeding five days.

   b) **"LOG TRUCKS ON ROAD"** - 15cm letters, black on yellow background. These signs must be erected at both ends of major roads used by log trucks. The signs must be removed immediately after the operation, or if there is a break in carting exceeding five days.

   c) **"FALLER AHEAD"** - 15cm letters, black on yellow background. These signs must be erected whenever falling is occurring near a roadway.

      Alternative :

      "TREE FELLING IN OPERATION" - 5cm black letters on fluorescent orange triangle; available from W.A. Forest Industries Training Council.

   d) **"GRADER AHEAD"** - 15cm letters, black on yellow background. These signs must be erected on both ends of the section of road being graded.

   e) **"ROAD PLANT AHEAD"** - 15cm letters, black on yellow background. These signs must be erected on both ends of the section of road being repaired.

   f) **"LOGGING OPERATIONS AHEAD"** - 15cm letters, black on yellow background. To be erected on roads whilst logging operations are occurring. Must be removed immediately after the operation is completed, or if there is a break in logging exceeding 5 days.

   All signs mounted on posts must be of diamond configuration. Signs placed temporarily on the ground must be rectangular.

3. The Forest Officer in Charge may stop haulage on any road in State forest if, in his opinion, continued haulage is likely to result in damage to the road, excessive turbidity in adjacent streams or the spread of dieback into dieback free forest.

4. The Forest Officer in Charge must ensure all truck drivers know exactly the name of the coupe or "operation" from which their load of logs has been extracted. The recommended method to eliminate confusion is to erect professionally made signs at the entrance to the coupe or "operation", or on the log landing. These signs should be yellow painted, triangular with 400mm side, with 50mm black letters, erected on a steel star picket.

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.5 LOGGING OPERATION INSPECTIONS AND CERTIFICATION

PART A - HARDWOOD OPERATIONS

1. The contractor's foreman or supervisor must check logging standards periodically on a feller's block by feller's block (or sub-coupe by sub-coupe) basis to ensure felling and extraction standards are maintained. CALM's Forest Representative will periodically accompany the contractor's foreman or supervisor on these inspections to monitor standards.

   Aspects of logging to be inspected include:

   - stump height
   - stump and log branding
   - in-forest treatment of logs
   - trees indicated for removal but not felled
   - trees felled but not removed
   - damage to retained (crop) trees by falling and/or skidding
   - extraction pattern
   - soil damage
   - dieback hygiene
   - tops disposal
   - erosion control structures.

2. **Formal Inspections**

   There are two types of formal inspection of a logging operation:-

   i) General inspection of all aspects of a logging operation by senior staff, and

   ii) Inspection of a logging operation with the specific intention of certifying as complete one or more faller's blocks or sub-coupes in that operation.

   2.1 General Inspection - This inspection should be carried out as often as considered necessary by senior staff in a District or Region. This inspection should be carried out with at least the treemarker and the contractor's foreman or supervisor in attendance. At the completion of such an inspection a report must be completed on CLM 105 (see attachment 4.5.1).

   This form should provide a permanent record of the standards achieved at that particular logging operation for the benefit of the Region, the District and the logging contractor.

   2.2 Feller's block (or sub-coupe) certification - this inspection must be regularly carried out on a systematic basis, by the contractor's foreman or supervisor, in order to formally certify to CALM that specific areas in an operation have been completed to CALM's standards. The unit area in these inspections is the feller's block or the sub-coupe. Inspections must be carried out with sufficient regularity to ensure a large backlog of non-certified feller's blocks or sub-coupes does not eventuate.

   The progress of these inspections must be recorded on form CLM 104 (See Attachment 4.5.2). One of these forms must be kept by the contractor's foreman or supervisor in charge of each logging coupe. This form is the official permanent record of the progress of completed cutting.

3. During any inspection the Forest Officer must use only yellow lumber crayon to initial and date stumps, and cross out unmerchantable timber. The contractor's foreman or supervisor must use only white lumber crayon for the same purposes. These markings will indicate that the area has been inspected.

4. Yellow flagging tape must be used to indicate trees to be felled and logs to be cut and/or snigged.

PART B - SOFTWOOD OPERATIONS

1. Inspection of softwood logging operations should be carried out on a daily basis. This is especially important where sawlogs are being produced.

2. The Forest representative should try to arrange inspections accompanied by the contractor's representative. When this is not possible, a suitable time to suit both parties, at least at weekly intervals, should be arranged.

3. All instructions to contractors should be done through the nominated contractor's representative.

4. Instructions regarding utilisation of forest produce and which log lengths to cut for orders must be issued to the contractors representative and the faller or processor operator.

5. The FOIC must ensure that all fallers and machine operators and the contractors representative have been instructed and trained in log specifications and cutting requirements.

6. Aspects of the operation to be inspected include:

   * the condition of the logging roads being used. (Bring to the contractor's attention any likely problems.)

   * contract operations safety equipment and clothing.

   * stump height, log lengths and crown diameters (measure a sample).

   * length of time logs are being left in the bush. (Watch for IPS attack and Blue stain developing.)

   * correct loading of bin measured materials. (No cross logs, gaps etc.)

   * crop tree stem damage.

   * trees left "hung-up".

   * signs of excessive soil damage or erosion.

   * adherance to requirements listed under the Code of Logging Practice relating to Fire Control (eg. fire attack pumper units and pack sprays available and working).

   * warning signs to ensure a safe working environment.

7. Results of formal inspections should be recorded on the Softwood Logging Inspection and Action Sheet (CLM 106). See Attachment 4.5.3.

8. A sound knowledge of the Code of Logging Practice is essential to maintain a good standard of operation. Most problems can be resolved by using the Code as a guide. If disputes cannot be resolved, the Regional S/F Softwood Logging is the first contact.

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

HARDWOOD LOGGING INSPECTION AND ACTION SHEET

To be completed by Forest Officer following general inspection of logging operation. If inspection results in official certification of completion of all or part of operation, details to be recorded on CLM 104.

OPERATION: ..... SUB COUPE OR FALLERS BLOCK (if applicable) .....
DIEBACK STATUS: ..... SOIL CONDITIONS: .....
LOGGING CREW DETAILS (Name equipment) .....
INSPECTION CARRIED OUT BY: CALM: .....
CONTRACTOR: .....
DATE: .....

ASPECT OF OPERATION		COMMENTS/ACTION REQUIRED
1	**COUPE PREPARATION**	
1.1	DEMARCATION OF DIEBACK BOUNDARIES	
1.2	DEMARCATION OF COUPE, SUBCOUPES, FALLERS BLOCKS	
1.3	LOCATION AND PREPARATION OF LANDINGS	
1.4	COUPE (OPERATION) SIGN	
1.5	ROAD WARNING SIGNS	
2	**FALLING AND EXTRACTION**	
2.1	TREES NOT FELLED	
2.2	STUMP HEIGHT	
2.3	LOG PREPARATION AT STUMP	
2.4	LOG EXTRACTION	
2.5	LOGS NOT EXTRACTED	
2.6	LOG PREPARATION AND SEGREGATION AT LANDING	
2.7	STUMP AND LOG BRANDING	
3	**ENVIRONMENTAL CONTROLS**	
3.1	DIEBACK HYGIENE PRACTICES	
3.2	PROTECTION OF CROP TREES	
3.3	TOPS DISPOSAL AROUND CROP TREES	
3.4	SOIL DAMAGE LEVEL	
3.5	EROSION CONTROL MEASURES	
3.6	LANDING AND TRACK REHABILITATION	
3.7	LITTER COLLECTION	
3.8	FIRE CONTROL	
4	**LOG MEASUREMENT BY CONTRACTOR** (IF APPLICABLE)	
4.1	METHOD	
4.2	ACCURACY	
5	**LOADING AND HAULAGE**	
5.1	STANDARD OF LOADING	
5.2	CONDITIONS OF ROADS	
5.3	MAINTENANCE OF ROADS	
6	**SAFETY**	
6.1	CREW ATTIRE	
6.2	EQUIPMENT	
6.3	PRACTICES	
7	**COMPLETION OF D/NOTES**	
8	**OTHER**	

SUMMARISING COMMENTS: CALM: .....
.....SIGNATURE.....
CONTRACTOR: .....
.....SIGNATURE.....

Distribution: White (original) contractor; Green (duplicate) CALM Region or District; Yellow (triplicate) CALM Region or District (Stays in book as files)

Attachment 4.5.2
CLM 104 (1990)

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

COMPLETION OF LOGGING OPERATION CERTIFICATION SHEET

OPERATION CODE CONTRACTOR

SUBCOUPE OR	CONTRACTOR CERTIFICATION			CALM CERTIFICATION		
	DATE	SIGNATURE	COMMENTS	DATE	SIGNATURE	COMMENTS
NO						
LANDINGS						
NO						
LANDINGS						
NO						
LANDINGS						
NO						
LANDINGS						
NO						
LANDINGS						
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LANDINGS						
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NO						
LANDINGS						

DATE OPERATION COMPLETED: ..... FOIC: .....

(SEE INSIDE BOOK COVER FOR INSTRUCTIONS FOR USE AND DISTRIBUTION)

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

SOFTWOOD LOGGING INSPECTION AND ACTION SHEET

INSPECTION DATE: ..... OPERATION NUMBER & TYPE: .....

DISTRICT: ..... INDUSTRY REPRESENTATIVE: .....

PLANTATION: ..... CONTRACTOR: .....

---

1. UTILISATION:

UTILISATION OF TREES FELLED: .....
STUMP HEIGHT: .....
LOGS TO BE EXTRACTED: .....
TREES TO BE HARVESTED: .....
DAMAGED CROP TREES TO BE REMOVED: .....
PRODUCTS CUT TO SPECIFICATION: .....

FURTHER ACTION REQUIRED: .....
.....
.....

2. CONTROL:

CROP TREE DAMAGE: [ ] ACCEPTABLE [ ] EXCESSIVE [ ] ASSESSMENT REQUIRED
CROP TREE PROTECTION: [ ] REQUIRED BY INDUSTRY [ ] DONE BY INDUSTRY
EROSION CONTROL & DRAINAGE: [ ] REQUIRED BY INDUSTRY [ ] DONE BY INDUSTRY
ACCESS ROADS: - FIREBREAKS TRAFFICABLE YES/NO
RUBBISH REMOVED: YES/NO

FURTHER ACTION REQUIRED: .....
.....
.....

3. SAFETY: FALLING: _____ EXTRACTING: _____
LOADING: _____ CARTING: _____

4. FIRE PRECAUTIONS: .....

5. COPY OF ACTION ITEMS GIVEN TO: .....

6. TARGET DATE FOR COMPLETION OF ACTION ITEMS: ___/___/___
FIELD CHECK DATE: ___/___/___

COMMENTS:

7. FOREST OFFICERS SIGNATURE, COMMENTS: .....
.....

8. INDUSTRY REPS SIGNATURE, COMMENTS: .....
.....

9. FOIC SIGNATURE, COMMENTS: .....
.....

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.6 BUSH STOCKPILING

1. Bush stockpiling is the practice of stockpiling unprepared logs in the forest to supplement mill stockpiles and is important in hardwood logging operations. Bush stockpiles are not designed to replace mill stockpiles, but are to enable the logging contractor to continue log haulage during periods of the year when extraction is not permitted. Mill stockpiles will always be preferred to bush stockpiles.

2. The contractor must obtain permission for bush stockpiling from the Forest Officer in Charge. Bush stockpiling of hardwood sawlogs should not start before the onset of cooler weather in early autumn. This coincides with a reduction in activity of the Bardi grub (Phorocantha semipunctata).

3. The location of bush stockpiles must be approved by the Forest Officer in Charge. Bush stockpiles must be located in areas accessible in all weather conditions.

4. All hardwood sawlogs in bush stockpiles must be removed to a mill by 15 October in any year.

5. A firebreak of 4m width must be constructed around every bush stockpile.

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.7 IN-FOREST LOG TREATMENT AND LOG SEGREGATION ON BUSH LANDINGS

1. IN FOREST TREATMENT

1.1 "In-forest treatment" refers to the process of applying sawcuts to a felled hardwood tree in order to prepare logs ready for measurement, prior to the logs leaving the bush landing.

Terms used in this process include "crown cutting", "long butting", "queen cutting", "docking" and "trimming". Definitions of these terms may be found in the "Log Faults" booklet by Clarke and Ellis (1989).

1.2. Efficient utilization of the timber resource requires efficient in-forest treatment. This in turn requires knowledge of product specifications, the relative value or priority of different products, and the In-Forest Treatment guidelines. Logging contractors and supervising CALM officers alike must be well versed in these matters. Product specifications and the relative value of different products are detailed in Section 6. To assist logging contractors and CALM staff involved in timber production, "In-Forest Log Treatment" guidelines have been written. These guidelines, reproduced below, are particularly relevant to operations required to produce both first and second grade hardwood sawlogs.

GUIDELINES FOR IN-FOREST LOG TREATMENT (HARDWOOD) - (1987)
(REVISED 1989,1992)

BACKGROUND

In integrated logging operations it is theoretically possible for over 20 different log product types to be produced by the one logging contractor from the one area at the one time.

It is therefore essential for logging contractors and CALM staff supervising logging operations to have a sound understanding of:

i) The specifications of the various log products.

ii) The relative priorities for production of the different log products.

iii) The basic rules to be observed in producing logs from trees that have the potential to produce more than one log product.

These guidelines address point (iii).

GUIDELINES

i) At the stump, after falling a tree, the faller must attempt to crown cut the tree at a point either:

a) where the crown end of the log displays 30% millable wood (this corresponds to the minimum standard for a second grade sawlog), or

b) if the wood quality is better than the 30% millable limit, where the diameter under bark reaches the minimum crown end diameter specified in the applicable contract of sale, or

c) where an unacceptable bend occurs beyond which there is insufficient log length to make a saleable product.

ii) At the stump, the butt end of a felled tree must not be docked, when the butt end face displays a minimum of 30% millable wood or more. If the butt end does not display a minimum of 30% millable wood, the faller must attempt to dock the butt end of the log at a point corresponding to 30% millable wood.

iii) No further docking of logs in the bush is permitted without the approval of the Forest Officer in Charge (FOIC).

All logs meeting the above standard must be snigged to a landing before further treatment.

iv) On the bush landing, all docking will be the responsibility of the FOIC. This does not mean that he must be present every time the logging contractor wishes to dock a log. Rather, the FOIC must ensure the logging contractor's employees fully understand the difference between the various log products, and the value and importance of sensible docking to maximise length and minimise waste.

v) On the bush landing docking will be minimised, in an attempt to:

a) maintain a greater average sawlog length, and

b) reduce the volume of docked waste at log landings.

vi) If docking is thought to be necessary, the following rules shall apply with respect to the production of first grade and second grade jarrah sawlogs.

a) For logs less than or equal to 5.0 metres in length:

. Attempt to sell the log, unaltered, as a first grade sawlog. (A log with a minimum of 50% millable wood as assessed on the worst end face).

. If the log cannot be sold as a first grade sawlog, consider docking up to 0.6m from one end only to produce a first grade sawlog.

. If it is considered that more than 0.6m needs to be docked to produce a first grade sawlog, sell the whole log as a second grade sawlog.

b) For logs greater than 5.0 metres in length:

. Attempt to sell the log, unaltered, as a first grade sawlog.

. If the log cannot be sold as a first grade sawlog, consider docking up to 0.6m from one end only to produce a first grade sawlog.

. If it is considered that more than 0.6m needs to be docked to produce a first grade sawlog, consider docking a minimum length of 2.5m to produce a short second grade sawlog and a longer first grade sawlog, or vice versa.

- If, by docking a minimum length of 2.5m, a minimum quality second grade log is likely to be produced, consider selling the whole log as a second grade log.

  NB: In areas of forest where the amount of bend in trees of relatively small diameter is such that a considerable amount of docking is required to meet either the first or second grade sawlog millability standards, it is almost impossible to avoid the creation of a high proportion of short logs. In these areas the FOIC should consider leaving these small diameter, bendy trees standing, in order to avoid the build up, on landings, of large volumes of short, low quality, unsaleable logs.

vii) If docking is thought necessary for karri and marri logs, the following rules apply:

(a) Karri first grade sawlogs - no docking is to be undertaken if the resulting second grade sawlog is less than 3.0m in length. The log length considered for the production of both first and second grade sawlogs should not be less than 6.0m prior to docking.

(b) Karri second grade sawlogs - where potential second grade sawlog is evident in otherwise chip or third grade logs, docking should be done to produce second grade sawlogs down to the minimum 2.4m length.

(c) Marri first grade sawlogs - the docking of marri logs to produce first grade sawlogs should be attempted if the lower grade product remaining is no less than 3.4m in length. The minimum log length considered for docking to produce a first grade log should be no less than 6.0m.

viii) Where log products of lower quality can be sold, the rules listed above should be adjusted to accommodate the minimum specification for those log products. For example, both the butt end and crown end of logs prepared at the stump will need to correspond to the minimum standard for the lowest quality log product, thereby replacing the 30% millable specification listed above.

ix) Regional procurement staff must ensure standards between District and Regions are consistent and maintained.

x) If any treatment of logs on a bush landing results in the removal of the faller's brand, the brand must be replaced on the treated log with white lumber crayon.

2. LOG SEGREGATION ON BUSH LANDINGS

2.1 "Log Segregation" is the practice of sorting or separating hardwood logs on a bush landing into different products prior to loading out.

Log segregation is an integral part of in-forest treatment, hence requires the same knowledge of product specifications and relative product values or priorities.

2.2 Log segregation is the responsibility of qualified logging contractor personnel, however Forest Officers may be required to mark or brand doubtful logs prior to loading out.

2.3 If different grades of hardwood logs need to be marked for identification purposes, either on a bush landing or on a truck, lumber crayon should be used as follows:

- Forest Officers - yellow lumber crayon
- Contractor personnel - white lumber crayon
- Premium grade sawlogs - letter "P"
- First grade sawlogs - Number "1"
- Second grade sawlogs - Number "2"
- Third grade sawlogs - Number "3"
- Chiplogs - "CHIP"
- Charcoal logs - "CHAR"

SECTION 4 - COUPE MANAGEMENT

SPECIFICATION 4.8 SUMMARY OF BUSH SIGNS AND MARKINGS

1. White painted crosses on the side of a tree (permanent)

   - coupe boundary
   - road reserve
   - stream reserve
   - amenity reserve
   - gravel pit boundary
   - special care zone

2. Yellow painted blazes on three sides of a tree (permanent)

   - boundary between dieback-infected forest and dieback-free forest, with the third painted blaze facing the dieback infected forest. (Note: If considered necessary, the fourth side of the tree may be blazed and painted with a yellow cross. This may be necessary in situations where the dieback-free forest is logged prior to the dieback infected forest.)

3.* Red Flagging Tape (i.e. tape with ends able to move in breeze)

   - sub-coupe boundary

   - ridge line

4.* White Flagging Tape

   - faller's block boundary

5. White painted band around tree

   - tree marked for retention (crop tree or seed tree)
     (NOTE: in softwood operations, the white painted band may be reduced to a slash or a dot.)

6.* White painted double bands around a number of trees in a rough circle

   - a group of trees marked for retention (crop trees).

7. Axe blaze on two sides of a tree with a "toemark" cut into the base of the tree

   - tree marked for removal, the toemark indicating the desired direction of fall.

8.* Red flagging tape and white flagging tape tied, one above the other, around a tree or bush

   - landing extremity

   - major snig track

9.* Yellow flagging tape tied around a tree

   - tree, missed by faller, which must be felled (if considered by faller to be safe.)

10.* Yellow flagging tape tied around a log, or stick or bush adjacent to a log

- log, missed by faller or skidder, which must be cut and/or extracted.

11. Yellow lumber crayon on a stump or log

- used by a Forest Officer to instruct contractor and/or record inspection of a logging operation. (Note: Green crayon may be used on light coloured species of wood such as pine.)

12. White lumber crayon on a stump, log or tree

- used by contractor supervisor or bush foreman to mark logs, instruct bush crew and/or record inspection of a logging operation. (NOTE: Blue crayon may be used on light coloured species of wood such as pine.)

13.* White and red striped tape tied around a tree or bush

- danger sign, used to indicate presence of a dangerous situation such as a tree hung-up, "widow-maker", etc.

14. White painted "S" on three sides of a tree

- tree marked for retention as a seed tree.

15.* Dayglo orange flagging tape tied around a tree or bush, with knot facing dieback

- initial dieback line marked in field by interpreters.

16.* Blue flagging tape

- used to indicate tree around which tops disposal is required.

17. Double blue painted bands around pine trees

- indication of boundaries of research plots; the bands are 150mm in width, 150mm apart, 2m above ground.

18. Large White painted "H" on two sides of a tree or on a log

- tree or log marked for retention for fauna habitat.

* Whenever possible, biodegradable tape should be used.

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.1 PROTECTION FROM JARRAH DIEBACK DISEASE

1. **DEFINITIONS:**

Technical terms used are as defined in the Technical Paper "Forestry Terminology in Western Australia", F H McKinnell, Forests Department 1982. Terms specific to dieback disease are as defined in CALM Briefing Paper 5/91. Definitions of terms mentioned in this section are printed below.

Cleandown

The removal of all potentially infected material from an object. This can be achieved by using a high pressure water jet (washdown), compressed air (blowdown) or a brush (brushdown).

Forest disease risk area

Any area of public land which in the opinion of the Executive Director may become infected with a forest disease and has been gazetted by the Governor as such on the recommendation of the Minister. Also known colloquially as "Quarantine Areas".

Front Barrier

A physical barrier to the movement of machinery placed at the front of a log landing, directly behind the soil disturbance caused by roading. Its purpose is to minimise the risk of infected soil being moved from the road onto the landing. A log of 40cm minimum diameter is required.

Ground Stripping

The systematic interpretation (inspection, sampling, decision, mapping) on foot of an area of forest for the presence of disease symptoms.

Hazard (in relation to dieback disease in forests)

The combination of environmental, climatic and management factors that influence the potential impact of dieback disease on a site should an infection become established.

Low

Few susceptible plant species present. If the pathogen were introduced symptoms would be evident as a few scattered deaths in the shrub layer.

Moderate

Some susceptible plant species present. If the pathogen were introduced most susceptible understorey plant species and less than 10 percent of susceptible overstorey species would die. Overstorey deaths would be scattered not clumped.

High

Many susceptible plant species present. If disease were introduced most susceptible understorey plant species and more than 10 percent of susceptible overstorey species would die.

Hazard Plan

A plan showing the spatial arrangement of hazard categories derived from landform, soils and vegetation information.

Hygiene (in relation to dieback disease)

Actions that decrease the risk of the pathogen being introduced, spread, intensified or surviving.

Hygiene categories

Categories applied to forest that describes its disease status. These categories are:

- Secure Dieback Free (SDF). Forest apparently free of dieback and upslope from Dieback, Suspect, Uninterpretable, and NEQ roads.

- Low Potential Risk (LPR). Forest apparently free of dieback but downslope from uninterpretable or NEQ considered to have a low potential for infection by *Phytophthora cinnamomi* by natural spread.

- Uninterpretable (UI). Forest in which susceptible plants are absent or too few to enable the interpretation of *P cinnamomi* presence or absence.

- Not Effectively Quarantined (NEQ). Forest adjacent to roads in which there is potential for incipient disease.

- High Potential Risk (HPR). Forest apparently free of dieback or Uninterpretable, but downslope or in the same swamp as Dieback or Suspect. Considered to have a high potential for infection by *P cinnamomi* by natural spread.

- Suspect. Forest in which the evidence for *P cinnamomi* presence or absence is inconclusive.

- Dieback (D/B). Forest areas which show current dieback symptoms and are supported by laboratory recoveries of *P cinnamomi* from root and soil samples.

Hygiene Plan

A plan showing the spatial distribution of diseased forest, disease free forest, forest of unknown disease status and areas put at risk of infection by natural spread.

Impact

The effect of disease on plant health

Mini-catchments

An area within a larger catchment which is self contained in terms of surface water runoff.

Rear barrier

A physical barrier to the movement of machinery placed at the rear of a log landing. All logs from the fallers block are delivered to the landing by being lifted or pushed over this barrier. A log of 40cm minimum diameter is required. Its purpose is to minimise the risk of infected material being moved from the landing onto the fallers block.

Risk (in relation to dieback disease)

The probability of an operation introducing, spreading or intensifying dieback disease, or allowing the pathogen to survive at a site.

Soil Movement

The movement of moist soil sticking to the wheels or tracks of vehicles.

Split phasing

The separation of component tasks of an operation in time and/or space, so as to minimise opportunities for dieback disease spread.

2. KNOWLEDGE

All personnel involved in hardwood harvesting must have a working knowledge of the biology and management of dieback disease and be certified competent by successfully completing an accredited training course supplied by CALM.

All personnel must be familiar with the content of this specification and the relevant sections of:

2.1 Policy Statement No. 3: "Phytophthora Dieback" (1991) (being revised)

2.2 Shearer, B.L., Tippett, J.P.; 1989
Jarrah Dieback: The Dynamics and Management of *Phytophthora cinnamomi* in the Jarrah (*Eucalyptus marginata*) Forest of South-western Australia
Research Bulletin No 3, Department of Conservation and Land Management

2.3 Dieback Hygiene Manual (July 1992)

2.4 Seven Way Test Guidelines (July 1990 update)

3. PRINCIPLES AND CROSS REFERENCES

3.1 The over-riding importance of jarrah dieback must be considered during all phases of every operation. The most important principle is that soil must not be transported from areas infested with dieback to areas free of dieback. In addition to this specification, dieback strategies to be followed are also contained in other sections of this Manual:

3.1.1 Planning (specifications 1.1, 1.2 and 1.3)

3.1.2 Roading (specifications 2.1, 2.2, 2.3, 2.4 and 2.5), and

3.1.3 Coupe Management (specifications 4.1, 4.3 and 4.4)

3.2 Assessing the Risk of Introduction and Spread of Dieback Disease

One of the fundamental questions which must be addressed in determining any hygiene strategy is "What is the risk of this operation introducing or spreading dieback disease?"

This question can be approached by considering three factors:

3.2.1 Is the type of operation likely to move infected material around (soil, roots, water)? For example are tracked or rubber-tyred machines to be used; is soil movement likely; will the operation be in muddy or sticky soils?

3.2.2 Are soil conditions such that soil is likely to stick to machinery and be moved around (moist and sticky)?

3.2 3 Are soil conditions such that the fungus will survive if delivered to a new site (moist)?

These issues are summarised in the following tables:

THE RISK OF INTRODUCING OR SPREADING DIEBACK DUE TO THE NATURE OF THE PROPOSED OPERATION

Highest Risk	Lowest Risk
Movement from dieback to dieback free	Movement within the same hygiene category
Operation over large area	Operation over small area
Complex operation	Simple operation
Much machinery	Little machinery
Much movement of soil	Little movement of soil
Untrained personnel	Well trained personnel
Inexperienced personnel	Experienced personnel
Without hygiene	With strict hygiene measures

THE RISK OF INTRODUCING OR SPREADING DIEBACK DUE TO THE NATURE OF THE SITE

Highest Risk	Lowest Risk
Dieback known nearby	Dieback not known nearby
Wet conditions	Dry conditions
Sticky soils	Non-sticking soils
Low-lying site	Elevated site
Uninterpretable	Interpretable

THE RISK OF THE PATHOGEN SURVIVING

Highest Risk	Lowest Risk
Moist soil	Dry soil
Propagule buried	Propagule exposed
Adjacent to or within host	Host absent

3.3 *Assessing the Dieback Disease Hazard*

Dieback disease hazard is a term which describes the final impact of the disease on a site if the disease were introduced. The final impact of dieback disease on a site depends on:

- the abundance of susceptible plant species present;
- the fertility, chemical and physical properties of the soils;
- the lateral and vertical drainage characteristics of the site;
- topography; and
- climate.

Assessing hazard allows the manager to gauge the consequences of a hygiene breakdown on the land use values of the site. The magnitude of the consequence combined with a judgement on the level of risk associated with the operation allows the manager to determine the level of resources that need to be committed to hygiene tactics.

Assessment of hazard is an imprecise science. It involves using vegetation associations, landform classifications and soil types as indices of the potential impact of dieback disease. It requires extensive knowledge of plant associations, disease biology and aetiology and experience of disease impacts on various sites. This task is most confidently performed by an expert.

3.4 *Evaluation*

The hygiene strategies to be used will be based on an evaluation of risk and hazard. This is done by means of the 7-way test as described in Section 1.2.

4. DIEBACK DEMARCATION

4.1 Responsibility

The demarcation of dieback boundaries in areas of forest to be logged is the responsibility of qualified dieback interpreters. Qualified District operations staff may provide assistance.

4.2 Timing

4.2.1 Field demarcation of all management boundaries with respect to dieback must be based on current, reliable hygiene information prepared from 230mm photography or ground stripping.

4.2.2 It will be necessary to recheck (and demarcate again if necessary) all areas of forest with a slope greater than 5^{o} that are downslope from dieback or suspect or uninterpretible or NEQ, if harvesting will take place after 12 months has elapsed since demarcation or the last check.

4.2.3 It will be necessary to recheck (and demarcate again if necessary) all areas of forest that have been mapped as secure dieback-free (ie, upslope from dieback, suspect, NEQ, uninterpretable) or that are relatively flat (less than 5^{o}), if harvesting will take place after a period of 24 months has elapsed since demarcation or the last check.

4.2.4 Checking by qualified personnel in spring or autumn is preferred because disease expression is most obvious at these times.

4.2.5 Demarcation must be completed before pre-harvest burning.

4.3 Method of marking

4.3.1 The initial demarcation of dieback boundaries in the field is done by CALM specialist staff responsible for dieback interpretation by placing dayglo orange flagging tape on trees or bushes. The knot of the marking tape will always face the "dieback infected" bush.

4.3.2 A Forest Officer is then responsible for the permanent marking of the dieback boundaries using yellow painted blazes on three sides of trees. Two blazes should face along the dieback boundary while the third blaze must face dieback or suspect. ie, on the "dieback" side of the tree. The blazed line must follow the dayglo orange tape marking, but discretion may be used to "smooth off" corners for practical purposes, provided the dieback line is shifted into dieback-free forest only.

4.3.3 The Forest Officer may use other personnel to assist in the permanent marking of dieback lines. Close supervision must be carried out in such instances.

4.4. Buffer Zones

The system of mapping disease occurrence is based on symptoms of indicator species that take varying periods of time, after infection, to become visible. The most recent indicator symptom occurs at or near the edge of the disease. It is logical to conclude that *P. cinnamomi* may be in the soil, or root systems of plants outside the visibly affected area, but that the susceptible plants are not affected. To avoid transporting infected soil and root material from such areas it is necessary to have a buffer zone between logging operations and disease infections.

The demarcation of buffer widths is the sole responsibility of the specialist dieback interpreters who use their judgement and guidelines set out in the Interpeters' Manual.

4.5 Hygiene Categories

When there is more than one hygiene category within an operational area, it is usually necessary to separate them in order to achieve the requirements identified in the 7-Way Test.

The hygiene categories recognised are:

* secure dieback-free
* low potential risk
* uninterpretable
* NEQ (not effectively quarantined).
* high potential risk
* suspect, and
* dieback

See definitions in Part 1 of this section.

Where it is necessary to separate hygiene categories District staff should be involved in the demarcation. The level of involvement will depend on the complexity of the area and the expertise of district staff. Attachment 5.1.1 gives guidelines for demarcation between hygiene categories. The most efficient method of demarcation is to use coupe or sub coupe boundaries.

4.6. Hazard categories

Dieback hazard is to be determined by trained staff (ie, interpreters, experienced district staff). Where it is necessary to separate operations in various hazard classes (as identified by the 7-Way Test) the demarcation is to be carried out by District staff.

The most efficient method of demarcation is on the basis of coupe or sub coupe boundaries.

5. HYGIENE TACTICS

Hygiene minimises the risk of dieback disease being spread or introduced:

Highest Risk	Lowest Risk
Contaminated equipment	Clean equipment
Tracked machines	Rubber-tyred machines
'Hot' landing	Split phase in time
Untrained staff	Trained staff
Unsupervised operators	Supervised operators
Multiple entries	Single entries
Large sub catchments	Small fallers' blocks
Disease distribution unknown	Disease distribution known
High in profile	Low profile roads
Uncontrolled access	Area secured
No stockpiling	Stockpiling
With soil movement	No soil movement

5.1 Machinery/vehicle cleandown

5.1.1 A key part of forest management with respect to dieback is the cleaning down of vehicles and machinery prior to entering dieback free or suspect or uninterpretable forest, and when leaving dieback infected, suspect, NEQ or uninterpretable forest. Forest Officers must regularly check the standard of vehicle/machinery cleanliness.

5.1.2 The aim is to clean the vehicle or machine of all soil, mud, dust and vegetable matter, especially from wheels or tracks, and from underneath the chassis.

5.1.3 Cleaning down may be carried out using a variety of equipment involving water, compressed air or brushes. When conditions are dry, compressed air is the preferred cleaning down technique, provided a machine or vehicle can be cleaned by such technique. The Forest Officer will specify the location and method of cleandown.

5.1.4 If water is used, then the fungicide sodium hypochlorite may be added to the washdown water at the rate of 1:2000. Sodium hypochlorite is corrosive and must not be added to drinking water, nor used in excessive quantities. Sodium hypochlorite, when added to water, has an effective life of only 24 hours. A new dosage must therefore be added to washdown water in a tank as soon as any additional water is put in the tank.

5.1.5 Washdown sites in the field (that is sites involving water) must be approved by the Forest Officer.

5.1.6 A washdown site must be placed to minimise the area put at risk. For example this may be achieved by locating the ramp or pad in dieback forest immediately adjacent to dieback-free forest and/or as low in the profile as possible ensuring washdown effluent drains into dieback infected forest.

5.1.7 Ramps and pads must be constructed and positioned so that vehicles do not drive through washdown effluent on entry and exit.

5.1.8 Avoid turbidity in nearby streams by leaving at least 50m of vegetation buffer, or by constructing a silt trap or sump.

5.2 Preventing the transport of infected soil

Propagules of *P. cinnamomi* survive in roots and clods of moist soil which if transported can start a new infection. It is vital therefore, that the transport of infested soil onto dieback free sites is avoided.

The following test is to be applied before harvesting machinery moves from infested to uninfested soil:

(a) Inspect the machinery to see if soil is carried.

(b) If the soil is being carried, then the transport of infested soil may occur and the hygiene conditions of paragraphs 5.3 - 5.6 will apply.

Within those areas which are free of *P. cinnamomi*, the movement of soil does not carry a risk of spread of dieback. However, the requirements for protection of soil properties (see Specification 5.2) must be observed.

5.3 General hygiene conditions

5.3.1 All harvesting operations will be subjected to a 7-way test. (See Section 1.2.)

5.3.2 Jarrah forest types will be logged using the most up to date hygiene prescriptions. Where information on dieback hazard is not available, harvesting under no soil movement conditions is required.

5.3.3 Periodic cessation of harvesting in jarrah forest types will be necessary for the maintenance of hygiene and to prevent soil damage.

5.3.4 Machinery and work methods that minimise the movement of soil are to be favoured.

5.3.5 Harvesting machinery will be cleaned down before entering or leaving a wandoo or karri coupe.

5.3.6 The same hygiene conditions are required inside and outside Disease Risk Areas (DRA).

5.3.7 Current, reliable hygiene and disease hazard plans are available and field demarcation of hygiene categories is reliable.

5.3.8 Burning before harvesting will be permitted provided field demarcation of hygiene boundaries has been completed (see Part 4. Dieback demarcation). Burning will only be approved to achieve necessary silvicultural or safety objectives. Burning must be approved by the Regional Manager. Harvesting must take place before the demarcation becomes unreliable as indicated in Parts 4.2.2 and 4.2.3.

5.3.9 A front hygiene barrier (see definition) will be used on all landings except those known to be dieback infected.

5.3.10 All hygiene barriers will be retained to ensure subsequent operations do not negate previous hygiene tactics.

5.3.11 Access to logging coupes will be made secure by closing roads adjacent to the coupes outside DRA in accordance with Forest Regulation 115(2) and CALM Act Section 134. The FOIC will implement road closure in accordance with district strategic roading plans.

5.4 Logging Under No Soil Movement Conditions (See Table below)

Logging under no soil movement conditions can only occur in jarrah forest when:

(a) the area is high hazard or uninterpretable moderate hazard, or
(b) the area is either north of the Preston River or in the Donnybrook Sunklands and is moderate hazard, or
(c) the area cannot be accessed without placing high hazard forest at risk, or
(d) the area (including karri sites) is upslope of high hazard forest.

5.5 Special Conditions For Logging With Soil Movement (see Table below)

5.5.1 Logging with soil movement conditions can occur when the area is low hazard, or the area is south of the Preston River excluding the Donnybrook Sunklands and is moderate hazard, but not uninterpretable and

(a) the area is accessible for logging without placing additional high hazard forest at risk, and
(b) the area (including karri sites) is not upslope of high hazard sites, and
(c) the area is demarcated into self contained mini catchments with individual fallers blocks not exceeding 10 hectares.

5.5.2 Dieback strategies required for planning (specifications 1.1, 1.2 and 1.3), roading (specifications 2.1, 2.2, 2.3, 2.4 and 2.5) and coupe management (specifications 4.1, 4.3 and 4.4) will be in place.

5.5.3 Landings will require the minimum of a front and rear hygiene barrier log. Split phase harvesting over time may be required at the FOIC's discretion. The use of static loaders is preferred where practical.

5.6 Dieback forest may be logged under either no soil movement or with soil movement conditions.

SUMMARY TABLE FOR PARTS 5.4, 5.5 and 5.6

(A) NORTH OF PRESTON RIVER OR DONNYBROOK SUNKLANDS

HYGIENE CATEGORY / HAZARD	* SECURE DIEBACK FREE or * LOW POTENTIAL RISK	* UNINTERPRET-ABLE or * SUSPECT	* HIGH POTENTIAL RISK, or * NEQ	* DIEBACK
LOW	SM+hygiene	SM+hygiene	SM+hygiene	SM
MODERATE	NSM+hygiene	NSM+hygiene	NSM+Hygiene	SM
HIGH	NSM+hygiene	NSM+hygiene	NSM+hygiene	SM

NSM - no soil movement
SM - with soil movement

(B) SOUTH OF PRESTON RIVER EXCLUDING DONNYBROOK SUNKLANDS

HYGIENE CATEGORY / HAZARD	* SECURE DIEBACK FREE or * LOW POTENTIAL RISK	* UNINTERPRET-ABLE or * SUSPECT	* HIGH POTENTIAL RISK, or * NEQ	* DIEBACK
LOW	SM+hygiene	SM+hygiene	SM+hygiene	SM
MODERATE	SM+hygiene	NSM+hygiene	SM+Hygiene	SM
HIGH	NSM+hygiene	NSM+hygiene	NSM+hygiene	SM

NSM - no soil movement
SM - with soil movement

Many areas where soil movement is acceptable will be logged under "no soil movement" conditions to cater for stockpiling and to comply with measures to protect the soil as required under section 5.2 - Protection of Soil.

5.7 *Stockpiling*

An essential hygiene tactic is to stockpile logs during periods of lowest risk, to enable operations to periodically cease as necessary for the maintenance of hygiene and to prevent soil damage. Stockpiles, or mill intakes, are monitored regularly (refer Specification 1.1, paragraph 2.3[4]).

DECISION GUIDE FOR DEMARCATION OF BOUNDARIES
BETWEEN DIFFERENT HYGIENE CATEGORIES IN THE JARRAH FOREST

ADJOINING HYGIENE CATEGORIES	LOW POTENTIAL RISK	UNINTERPRET-ABLE	SUSPECT	HIGH POTENTIAL RISK	NOT EFFECTIVELY QUARANTINED	DIEBACK
SECURE DIEBACK FREE	YES (SM or old maps) NO (NSM or new maps)	Yes (all ops)	Yes (all ops)	Yes (all ops)	Yes (all ops)	Yes (all ops)
LOW POTENTIAL RISK		YES (LPR not below uninterpretable NO (LPR below uninterpretable)	Yes (all ops)	Yes (all ops)	Yes (SM or old maps) No (NSM LPR below NEQ or new maps)	Yes (all ops)
UNINTERPRET-ABLE			Yes (all ops)	Yes (all ops)	Yes (all ops)	Yes (all ops)
SUSPECT				Yes (all ops)	Yes (all ops)	Yes (all ops)
HIGH POTENTIAL RISK					Yes (all ops)	Yes (SM) No (NSM)
NOT EFFECTIVELY QUARANTINED						Yes (all ops)

SM = with soil movement
NSM = no soil movement

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.2 PROTECTION OF SOIL (INCLUDING REHABILITATION MEASURES)

PART A - HARDWOOD OPERATIONS

1. Soil Damage

1.1 Damaged soil is soil that has either:

a) had the A horizon (topsoil) removed,
b) had the A horizon (topsoil) mixed with the B horizon (subsoil usually containing clay)
c) suffered severe compaction (meaning compaction which will affect germination or growth of plants). This normally applies to all landings, and
d) been affected by all 3 of the above.

1.2 Soil is usually damaged during log extraction operations in wet soil conditions.

1.3 In selectively cut forest (ie, jarrah forest, karri thinnings) soil damage must not exceed 10% in area of any single feller's block or sub-coupe, including the landing. If a Forest Officer considers that damage is approaching 10% then he must:

a) survey the feller's block (compass and pace method), plot on graph paper and calculate total area,
b) measure the perimeter of the landing and calculate area,
c) plot four parallel lines at right angles to the general snigging direction, the four lines positioned to divide the feller's block into five approximately equal sections,
d) pace along each sample line, classifying each pace as damaged or undamaged soil, and
e) record all the above data on a "Field Assessment of Soil Damage" sheet (form CLM108), and calculate percentage of damaged soil.

If the total area of soil damage, including the landing, is greater than 10% then skidding in that fellers block must cease immediately. The logging contractor will then be asked to select the best area in the coupe to continue logging. If the damage levels are exceeded in the best area then the whole coupe will be closed.

Attachment 5.2.1 is a "Field Assessment of Soil Damage" sheet (CLM 108).

1.4 In clearfelling situations (ie, karri forest) the acceptable limits of soil damage are 5% with respect to landings and 20% overall. In clearfelling situations where a "partial cut" or "pre logging" is allowed, the respective limits are 5% and 15%, thus allowing for additional damage during the final cut.

1.5 If skidding is stopped in a feller's block because of excessive soil damage then it cannot recommence in that block until the Forest Officer in Charge decides that the soil is dry enough. This decision cannot be made until the local Soil Dryness Index exceeds 500 in the Northern Jarrah Forest and 250 in the Southern Jarrah and Karri Forest.

1.6 Damaged soil must be rehabilitated by the logging contractor by the following first day of May, as directed by and to the satisfaction of the Forest Officer in Charge.

On clearfelled areas, rehabilitation will require the ripping and levelling of all damaged soil on affected snig tracks and landings. Ripping must be carried out to a depth of 500mm and at 1 metre spacing. The logging contractor must make available suitable machinery to carry out this work. On thinned forest areas, rehabilitation will require raking of damaged soil to promote germination. Ripping likely to damage crop tree roots should not be carried out.

2. Erosion Control

2.1 CALM staff and logging contractors must be aware of the potential for soil erosion along snig tracks during wet weather.

2.2 When skidding is completed in any faller's block, and prior to machinery leaving it, interceptor banks and drains must be constructed across all snig tracks with exposed soil, to the following standards:

a) Interceptor bank/drain spacing:

Slope	On lateritic gravels	On all other soils
0 - 2°	Nil	Nil
3 - 5°	200m	100m
6 - 10°	100m	50m
11 - 15°	60m	30m
16° +	30m	15m

b) Size of interceptor banks:
minimum of 40cm high and 40cm thick, using soil or logging debris

c) Angle of interceptor banks:
0.3-0.5% from horizontal.

d) Dispersal of water from interceptor drains:
The interceptor banks/drains must be constructed so that water is directed into vegetation or silt traps without ponding.

2.3 Erosion control work should be carried out at any time during the course of logging, if rainfall is imminent. Such work shall be to the standards listed in 2.2 above.

3. Rehabilitation of Landings

3.1 All landings must be rehabilitated by the logging contractor to the satisfaction of the FOIC. All landings requiring ripping must be rehabilitated within 18 months of certification of the sub-coupe or feller's block. All other landings must be rehabilitated in conjunction with the completion of loading out.

3.2 In areas where logging is carried out concurrently by more than one logging contractor, the task of rehabilitation of landings must be shared by the different logging contractors as directed by the FOIC.

3.3 In areas where a logging operation is carried out over an extended time period by more than one logging contractor, the task of rehabilitation of landings must be completed by each logging contractor at the completion of his operation.

3.4 Rehabilitation of landings will involve:

a) the heaping or windrowing of clearing and logging debris along the sides and rear of landings, such heaps or windrows to be no closer than 5m from crop trees.

b) replacement of topsoil.

c) the ripping of any damaged soil (such as on landings in karri clearfell areas, and on other landings where the soil horizons have been mixed) to a depth of 500mm and a general spacing of 1 metre, parallel to the natural contour of the land. Ripping will be considered adequate when an 8mm rod can be driven [a] to 500mm into the landing in rip lines and [b] to 200mm/ over 60% of the remainder of the landing.

d) elsewhere, the levelling and raking of any disturbed soil again parallel to the natural contour of the land.

Note: in situations where reject material can or is likely to be sold, for example as firewood or charcoal logs or third grade sawlogs, then such material should not be heaped or windrowed at sides or rear of landing, but should be neatly stacked at the front of the landing before any soil rehabilitation work takes place. This enables such logs to be loaded out at a later date without unnecessary machine movement on the landing.

3.5 All rehabilitation must be carried out in strict accordance with dieback hygiene principles, as directed by the FOIC.

3.6 Any burning of debris considered necessary will be carried out by the relevant CALM District following rehabilitation.

3.7 Any seeding or planting or fertilizing considered necessary must be carried out by the logging contractor(s) during the winter following rehabilitation. Seeds, plants and fertilizer will be supplied by CALM.

PART B - SOFTWOOD OPERATIONS

1. Because of the relative areas planted on hills and in coastal plantations, it will be necessary to operate in some hill plantations in winter. Good planning of the timing and the siting of operations will minimise soil and environmental damage to plantations and firebreaks.

2. The FOIC should exercise his discretion in stopping, either all or part of, the operation until weather conditions improve. Until more quantifiable data is available, consideration should be given to stopping operations while there is free water running in the table drains of the road being operated on.

3. Any deep wheel ruts, or other damage which may occur, must be repaired during the ensuing summer period, as part of the overall firebreak maintenance programme. Particular attention needs to be paid to landing points.

4. Protection of soil adjacent to water reservoirs:

Plantations adjacent to reservoirs require special treatment to prevent turbidity, and care should be taken at all stages of logging.

4.1 Visible turbidity results from soil disturbance and surface erosion on either roads or outrows. Excessive soil disturbance can occur when the soil is saturated or when powdering of the soil occurs during summer.

4.2 A favourable time for logging can be late spring, when the ground is moist but not saturated. This prevents powdering of soil and subsequent turbid runoff.

4.3 The opportunity for surface erosion to occur is greatest immediately after the disturbance and decreases with time. Any control measures prescribed to minimise erosion must be well planned and implemented as soon as possible, following the disturbance.

4.4 Winter logging adjacent to reservoirs should be minimised or excluded where possible.

4.5 Undisturbed filter strips adjacent to the reservoir or major creeks are required to filter water runoff. Depending on topography, the filter strips may have to be a full compartment wide or just a strip between the lowest road and the reservoir.

4.6 Logging should cease within 40m of reservoirs at the first sign of excessive soils disturbance or erosion likely to cause turbidity.

4.7 Mechanical harvesters or processors leave a greater amount of debris on the outrows, reducing the potential disturbance by the forwarder.

4.8 Cross drains may be required on outrows adjacent to a haul road.

4.9 Winter haul roads which cross major creeks close to reservoirs must be:

(a) stabilised by water binding, or other suitable means, for 40m on either side of the creek.

(b) crowned and sufficiently drained, using adequate side drains and culverts with silt traps leading into vegetation filters.

4.10 Roads adjacent to reservoirs should not be used for hauling if they are likely to become heavily powdered during summer operations.

FIELD ASSESSMENT OF SOIL DAMAGE (HARDWOOD)

DISTRICT..... FELLERS BLOCK.....

BLOCK/CPT..... CONTRACTOR DETAILS.....

COUPE .....

CUTTING PRESCRIPTION .....

.....

PLOT OF FELLERS BLOCK (ATTACHED)

SURVEY SUMMARY

1. Total area of feller's block _____ m^2
2. Area of landing _____ m^2
3. Skidding damage:

E Line	Damaged	Undamaged	Total
1			
2			
3			
4			
Total	(a)	(b)	(c)

Skidding damage = $\frac{(a)}{(c)} \times 100$ = ...%

4. Total damage = 2) + 3) = ...%

RECOMMENDATION

1. Operation can continue; survey to be repeated ..... (nominated when)

or

2. Fellers block closed.

Date of assessment - .....

Officer compiling - .....

Distribution: 1. Logging Operator
2. R/L Procurement
3. District File

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.3 PROTECTION OF WATER

1. Many catchments in State forest are harnessed, that is the water from such catchments is collected in man-made reservoirs for industrial and/or domestic use. It is therefore essential that effective water protection measures are undertaken during all phases of logging.

2. During logging operations measures must be taken to protect water from unnatural increases in:

   i) salinity (the salt content of water)
   ii) sedimentation (the deposition downstream from a source of disturbance, of material across the full range of particle size)
   iii) siltation (the deposition of particles larger than clay but smaller than sand)
   iv) turbidity (discolouration of water due to suspended silt, clay or organic matter)

3. Water protection measures are necessary during:

   a) planning (specification 1.1)
   b) road construction and maintenance (specifications 2.3 and 2.4)
   c) gravel pit working and rehabilitation (specification 2.5)
   d) coupe demarcation (specification 4.1)
   e) extraction (specification 4.3)
   f) haulage (specification 4.4)
   g) logging operation inspection and certification (4.5)
   h) protection from jarrah dieback (5.1)
   i) protection of soil (specification 5.2)

   CALM staff and logging contractors must be totally familiar with the requirements for protection of water as detailed in the above specifications.
   Details of river and stream buffer widths are contained in Specification 4.1.

4. No roading or logging may take place within 500m of the high water mark of any reservoir without prior notification to the relevant Water Authority.

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.4 PROTECTION OF CROP TREES

1. Logging contractors must make every effort during all phases of logging to protect marked crop trees from physical damage. Physical damage is any damage resulting in one or more of the following:

   a) The exposure of more than 100cm^2 of cambium on the bole of a crop tree.
   b) The falling, breaking, or uprooting of a crop tree, or
   c) The removal of more than 30% of the crown of a crop tree.

2. Periodical assessments of crop tree damage must be carried out by a Forest Officer using the "Assessment of Crop Tree Damage" form. In carrying out these assessments, a Forest Officer must assess a sample of at least 100 crop trees in a given faller's block or sub-coupe or softwood operation. The sample should consist of at least three 10m wide assessment lines across the fallers block or sub-coupe in hardwood logging operations. In softwood operations the sample must include trees from at least 8 rows of trees. The results should be written on the CLM Form107 (Attachment 5.4.1).

3. If more than 5% of trees assessed are damaged, then the logging contractor may be charged for all damaged trees in that faller's block at rates determined from time to time by the Executive Director.

4. Copies of all crop tree damage assessments must be handed immediately to the relevant FOIC. Copies must be forwarded to the Manager of the relevant logging contractor, and the relevant Bush Supervisor.

5. Tops Disposal

   As well as avoiding physical damage, logging contractors must ensure that all logging debris created by a logging operation is removed from the base of crop trees. This task is commonly known as "tops disposal" and is designed to protect crop trees from fire damage. The debris to be removed includes all woody material greater than 75mm diameter. This material must be moved at least 1m away from the bole of a crop tree. Tops disposal must be completed before a faller's block or sub-coupe is certified complete. Bush Supervisors should encourage fallers and skidder drivers to carry out tops disposal during the course of a logging operation.

6. Trees that require tops disposal are to be highlighted by use of blue flagging tape.

FIELD ASSESSMENT OF CROP TREE DAMAGE

DISTRICT..... CONTRACTOR.....

BLOCK/PLANTATION..... LOGGING DETAILS.....

OPERATION .....

FELLERS BLOCK..... DATE OF ASSESSMENT.....

A. DAMAGE ASSESSMENT

Number of trees assessed .....(minimum sample of 100 trees)

Number of trees damaged .....

Percentage of trees damaged .....%

B. COMMENTS

.....

.....

C. RECOMMENDATIONS

.....

.....

Officer Compiling.....

Information re completing this form:

1. Damaged trees are those crop trees that:

   a) have more than 100cm^2 of cambium exposed,
   b) have been felled, broken in two or uprooted, or
   c) have more than 30% of crown removed.

2. In "Logging Details" specify type of machinery involved and names of feller and skidder driver.

3. In "Comments" write down:

   a) any environmental or other factors, if any, that may have affected the result of the assessment and
   b) whether this assessment has indicated an improvement or worsening of performance by the contractor.

4. If, in "Recommendations" it is recommended that the contractor be charged for crop tree damage, the total number of crop trees in the feller's block must be assessed and the total number of damaged crop trees determined.

5. Forward this form immediately to District Manager; copies to Bush Supervisor and Manager of Logging contractor.

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.5 PROTECTION OF THE VISUAL RESOURCE (LANDSCAPE)

1. The visual quality of land is an important resource in its own right which can be identified, assessed and managed in much the same way as other resource values.

2. Visual Resource Management (VRM) must be consistent and, if necessary, a harvesting proposal must include a site inventory and analysis of landscape factors. An assessment of projected impact of the operation on scenic values is required.

3. Visual resource assessment must be guided by the Department's Visual Management System (VMS) where it is complete and operative.

4. Where the VMS is in place, if harvesting proposals attain the established visual quality objectives, no conflict with scenic resources is expected. Where predicted impact is greater than the desired visual objective either the proposal is modified or the scenic resource degradation is recognised and documented.

5. Where the VMS is in place, prescriptions and guidelines are written for each type of land alteration, eg., clearfelling, selection cutting, scrub rolling, road and landing location and prescribed burning. These should be understood and utilized.

6. Where the VMS is incomplete the following broad guidelines should guide harvest planning and operations :

   a) coupes should be selected and designed within the context of the total landscape. Cumulative impact must be predicted and evaluated in terms of a total zone or viewshed.

   b) coupe shape should be determined by factors inherent to the landscape such as topography, stream courses, ridgelines and vegetation patterns.

   c) primary factors which determine the ability of land to absorb change should be identified and assessed. These are slope, soil colours, erosion potential, vegetation pattern and vegetation density.

   d) in the most sensitive viewsheds, such as foreground and middleground areas seen from primary travel routes or use areas, special assessment studies or prescriptions may be required to ensure that visual values are protected.

   e) transition between harvesting areas and natural forest should be gradual and subtle. Gradational cutting methods should be employed in very sensitive visual zones.

   f) islands or corridors of trees within harvesting areas should be retained in a manner which borrows from naturally established form, line, colour and texture.

g) regrowth rates and screening potential should be evaluated and integrated into coupe harvest sequencing plans.

h) snig tracks and temporary roads should be reduced to a minimum. Tracks on the contour should be used in preference to vertical alignments.

i) landings should be located where topography or vegetation provides a screen from primary viewer positions.

7. Areas of past harvesting which do not meet desired levels of visual quality should have rehabilitation plans prepared and implemented at the earliest possible time.

8. Staff of the Visual Resource Management section of the Recreation, Landscape and Community Education Branch should be consulted by planning and operations staff for assistance in applying the Department's VRM policy.

A written policy, No. 34, dated Nov. 1989, is relevant to this subject and should be familiar to all planning and operations staff.

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.6 PROTECTION OF DECLARED RARE FLORA

1. Background

Declared Rare Flora (DRF) are those species listed in the schedule that are regarded as being threatened with becoming extinct, and have special Ministerial protection under the Wildlife Conservation Act. No plant of these species can be taken without the written consent of the Minister, and this applies on all lands, and is binding on the Crown - that is, Government employees also need to apply to the Minister to take. 'To take' includes any action that damages, or allows damage to be caused to a plant. A breach of this provision is liable to a fine of up to $10,000.

Priority flora, in categories 1 to 3, are those species held in a supplementary list that might be threatened with extinction, but for which there is insufficient information on which to make a proper assessment, ie; poorly known species. The priority code refers to the requirement for further survey. Priority 4 species are presumed extinct and are now included in the DRF schedule (so that they are immediately afforded maximum protection in the event of rediscovery), and Priority 5 species are rare but not threatened, usually because of their presence on CALM lands. While the priority flora do not have the same specific level of protection as the DRF, it is CALM's responsibility to ensure that their conservation status is not reduced as a consequence of activities over which we have control.

2. Operational Procedures

(a) Prior to any operation that will not cause the permanent destruction of vegetation (eg: burning or selective logging), information sources are to be consulted to check for the presence of DRF or priority flora.

i) If no DRF or priority flora are recorded for the area, then operation may proceed.

ii) If DRF or priority flora are present, make every attempt to modify the plan to exclude these plants from impact by the operation; and

iii) If the DRF or priority flora cannot be excluded from impact by the operation:

* ensure that the population has been monitored recently so that current status is known. Undertake monitoring (using Rare Flora Report Form) if no recent monitoring has been done;

* in the case of DRF, apply to Wildlife Branch for Ministerial 'Permit to Take', using standard application form. Application should address options, current status of population, expected impact, expected effect on the population, relative importance of the population to the conservation of the species etc. Sufficient time must be allowed for the application to be processed, including time to answer requests for more information;

* if approval is given for the taking of DRF, or if priority flora are to be taken, take actions to minimise damage, such as, mark the population on the ground, issue specific instructions to contractors, mark logging plans or job prescription sheets;

* after the operation, monitor the impact on, and regeneration of, the DRF or priority flora.

(b) Prior to any operation that will result in the long term destruction of vegetation (eg: road construction, placement of timber landing, snig routes), flora information sources should be consulted and in addition the area should be surveyed for DRF and priority flora, unless such a survey of the specific area has already been done. Actions relating to the presence or absence of DRF or priority flora are then as above.

3. Maintenance Grading

If DRF or priority flora are located adjacent to a logging road, firebreak etc, which is subject to maintenance, then the population should be marked with standard rare flora roadside markers to prevent accidental damage. If the flora invades the maintenance area then the operation must be assessed as above. If DRF needs to be removed for track maintenance, then a permit to take must be applied for.

4. Staff Training

Appropriate staff in each District, especially the Endangered Flora Officer, will be trained in the recognition and management of DRF and priority flora. Training may be arranged via Wildlife Branch or Research Division.

Each District (and optionally Region) should maintain a field herbarium of DRF and priority flora from that area. Note that Ministerial permits are required to collect specimens of DRF.

Each species should be represented by a mounted specimen and a description of its form and habitat. Colour photos will also assist in identification.

5. Contacts

For advice on the status and management of DRF and priority flora, contact Wildlife Branch at Como, G. McCutcheon at Bunbury, or the Regional Ecologist at Kelmscott.

6. References

'Western Australia's Endangered Flora' by S Hopper, S van Leeuwen, A Brown and S Patrick (CALM 1990) provides general information on threatened flora, plus colour photographs of all the 1989 DRF with a brief description of habit, habitat and location.

'Declared Rare Flora and Other Plants in Need of Special Protection in the Northern Forest Region' (Wildlife Management Programme No. 5, CALM 1990) provides management information for that region.

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.7 PROTECTION FROM FIRE

1. The logging contractor has certain fire control requirements specified in the relevant Contract to Supply. They are also outlined in the Code of Logging Practice.

2. Each District, through its nominated FOIC, must ensure that the fire control provisions of the contract and the Code are strictly adhered to. This includes training of the contractors' personnel.

3. In softwood logging operations the FOIC may prohibit any, or all types of, logging operations at such times, and for such periods, as is necessary when, in the officer's opinion, such action is warranted by the CALM Fire Danger ratings. The following restrictions apply in softwood plantations:

	Chainsaws	Logging Equipment	Load on Cleared Break
HILLS PLANTATIONS	0-60m/hr No Restrictions 60m+ Cease Ops	0-60m/hr No Restrictions 60m+ Cease Ops	0-140m/hr No Restrictions 140m+ Cease Ops
COASTAL PLANTATIONS (a) Prescribed Burnt	0-140m/hr No Restrictions 140m+ Cease Ops	0-140m/hr No Restrictions 140m+ Cease Ops	0-140m/hr No Restrictions 140m+ Cease Ops
(b) Unburnt	0-60m/hr No Restrictions 60m+ Cease Ops	0-60m/hr No Restrictions 60m+ Cease Ops	0-140m/hr No Restrictions 140m+ Cease Ops

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.8 PROTECTION OF SPECIAL HABITAT

1. The FOIC must ensure that habitat of any known Declared Rare Fauna is protected from the impacts of the logging operation.

2. Wildlife corridors, including road, river and stream zones, must be demarcated in the field, and access by logging equipment strictly controlled.

3. Habitat trees and logs, as described in the relevant Silvicultural prescription, must be identified and marked in the field.

4. Where an area to be logged contains habitat suited to a species of fauna which is the subject of a Rare Fauna Species Management Plan; the requirements of that plan will be integrated into silvicultural specifications for that area.

5. Diverse ecotype zones such as heathlands, sedge, rock outcrops, swamps, lakes, wetlands and low shrubby woodlands must be identified and protected from disturbance by logging equipment.

6. Logging contractors must make every effort during all phases of logging to protect marked habitat from physical damage.

SECTION 6 - LOG SPECIFICATIONS AND QUANTITY DETERMINATION

SPECIFICATION 6.1 GENERAL DESCRIPTION OF LOG PRODUCT TYPES

1. **Log Product Types**

A complete list of currently recognised species and log product types, both hardwood and softwood, may be found in Section 1 of the L.O.I.S. System Codes Manual. The most important types are explained below:

1.1 **Sawlogs**

Sawlogs are logs prepared in the bush for cutting at a registered sawmill into sawn products such as, for example, sleepers, boards or scantling. Any log that is considered to be merchantable, that is, worth cutting into sawn products, may be classed as a sawlog. For commercial purposes however, several types of sawlogs are recognised, the most important being:

(a) Hardwood sawlogs

- **Premium Grade Sawlogs** - these are the highest quality sawlogs that may be sold for specific end uses such as seasoned timber for furniture manufacture.

- **First Grade Sawlogs** - this is the most common type of sawlog cut. The minimum length and minimum crown diameter under bark of a First Grade Sawlog is generally 2.1m (or 2.4m) and 250mm (or 300mm) for jarrah (and karri) respectively, and the minimum amount of millable wood in such a log is generally set at 50% as assessed on the worst end.

- **Second Grade Sawlogs** - these are sawlogs below the standard of First Grade Sawlogs. Unless otherwise indicated, the minimum standard of a second grade sawlog is 2.1m in length and 250mm in crown diameter under bark, with at least 30% of millable wood as assessed on the worst end.

- **Third Grade Sawlogs** - these are sawlogs, below normal Second Grade Sawlog quality, that may be sold by the Department. Third Grade Sawlogs have no minimum standard and selection of such logs from reject material on bush landings is the responsibility of the buyer.

- **Medium Sawlogs** - these are Karri sawlogs, of minimum length 2.4m, and between 200mm and 300mm crown diameter under bark, usually cut from regrowth forest.

- **Small Sawlogs** - these are sawlogs, either Karri or Jarrah, with diameters under bark, of 150-200mm for Karri and 200-250mm for Jarrah.

- **Short Sawlogs** - these are sawlogs, of a specific quality, and below a specific length, that may be sold for specific end uses.

(b) Softwood sawlogs

- **First Class Sawlogs** - these are high quality pine sawlogs at least 300mm in diameter under bark and 4.8m in length. First Class Sawlogs are obtained from plantations at least 25 years of age.

- **Second Class Sawlogs** - these are lower grade pine sawlogs of diameter down to 200mm and length down to 2.1m.

- **Third Class Sawlogs** - these are sawlogs, below Second Class Sawlogs in quality, selected by the buyer.

- **Small Sawlogs** - these are sawlogs of small end diameter under bark between 150 and 200mm.

- **Sawlogs** - these are sawlogs where stumpage is based on mid log diameter rather than class of log (eg: at Wespine when scanner is operational). These logs are normally of minimum small end diameter under bark of 200mm, with minimum length of 2.4m, and are from plantations of at least 18 years in age.

1.2 **Veneer Logs**

Veneer or "peeler" logs are logs intended for slicing or peeling into sheets for the production of veneer or plywood. Veneer logs must be of a consistently high quality, with much less allowable defect than sawlogs.

Softwood peeler logs that are prepared in good faith to the set specification but are below standard are sold as "Second Class Peeler" logs.

1.3 **Bridge and Jetty Timbers**

Bridge and Jetty Timbers are hardwood logs intended for use in the construction of bridges, wharves and jetties. Like Veneer Logs, Bridge and Jetty Timbers must be of a consistently higher quality than sawlogs. Most Bridge Timbers are produced for use by the Main Roads Department. Most Jetty Timbers are produced for use by the Marine and Harbours Department. There are four types of Bridge and Jetty Timbers.

1.3.1) **Piles** - these are high quality, straight logs, driven into the ground, in bridges, wharves and jetties.

1.3.2) **Stringers** - these are high quality, straight logs, placed lengthwise on piles.

1.3.3) **Corbels** - these are short lengths of high quality log, placed lengthwise, on top of piles, to support stringers.

1.3.4) **Bedlogs** - these are logs placed lengthwise on the ground, used to support stringers.

Note: bridge and jetty timbers are originally produced from the forest as "unprocessed round timbers".

1.4 Poles

Poles are long, straight logs used in an upright position to support loads above ground. Poles are usually of smaller diameter than Bridge Timbers, but must be of a similar high quality. Most poles are produced for use by the State Energy Commission of WA in supporting transmission and other lines. The amount of defect allowable in poles can vary depending on whether or not the pole is to be treated with preservative. Species currently accepted by SECWA are jarrah, marri, blackbutt, karri, yellow stringybark, radiata pine and pinaster pine.

Note: poles are originally produced from the forest as "unprocessed round timbers".

1.5 Chip Logs

Chiplogs are marri, karri or globulus logs destined for conversion into woodchips at the Diamond Mill at Manjimup.

1.6 Mining Timbers

Mining Timbers are generally short, straight lengths of jarrah log, of crown diameter under bark between 125mm and 250mm, used to support underground coal mines at Collie. Three terms commonly used are :

a) **Props** - these are short lengths, say 2.4m or 2.7m used in an upright position in direct contact with the roof of a mine.

b) **Legs** - these are similar to props, but are used to support Bars.

c) **Bars** - these are longer lengths, say up to 5.1m, and are placed horizontally on top of Legs. They support the roof of a mine.

1.7 Charcoal Logs

Charcoal logs are jarrah logs destined for conversion into charcoal at Simcoa's plant at Kemerton.

1.8 Industrial Wood

Industrial wood is the term used to describe pine logs produced for conversion into particle board or medium density fibreboard. Recently, small diameter, low quality jarrah and marri logs have been trialled for particle board and MDF.

1.9 Pine Rounds for Treatment

Pine rounds for treatment are small diameter radiata or pinaster logs sold for preparation and preservative treatment then used in fencing and other applications.

1.10 Domestic Firewood Logs

Most firewood for domestic use is collected from the forest by the public free of royalty, or harvested by commercial firewood operators and transported from the forest in block form. Increasing amounts however are sold by CALM in log form. The predominant species is jarrah.

1.11 Minor Forest Produce

Minor Forest Produce is a general term used to describe a range of generally lower value products (including firewood) that may be harvested or collected from forests or plantations. In most cases the individual piece size, and total volume per unit area, of Minor Forest Produce is small. Specification 6.4 in this Manual lists the types of Minor Forest Produce that may be produced.

2. Log Defects

The assessment of defect or fault in the log product types listed above is a task that requires considerable knowledge, experience and judgement. The booklet "Log Faults - a glossary of defects and other characteristics of trees and logs in the South West of Western Australia" by Clarke and Ellis (1989) lists and explains all common log defects or characteristics.

SECTION 6 - LOG SPECIFICATIONS AND QUANTITY DETERMINATION

SPECIFICATION 6.2 HARDWOOD LOG SPECIFICATIONS

Standard specifications for all hardwood log products are reproduced below. These specifications may be used as a general reference by Forest officers and contractors, however, because there may be small but significant variations to some log specifications in some Contracts to Supply and Contracts of Sale, the specifications included in those Contracts must be checked and used as the official specification in every case.

The standard hardwood log specifications reproduced below are:

(1) Premium grade sawlogs
(2) First grade sawlogs (jarrah, blackbutt and wandoo)
(3) First grade sawlogs (karri)
(4) First grade sawlogs.(marri)
(5) Second grade sawlogs (jarrah, blackbutt and wandoo)
(6) Second grade sawlogs (karri and marri)
(7) Third grade sawlogs
(8) Veneer logs
(9) Unprocessed round timbers suitable for preparation into bridge and jetty timbers
(10) Unprocessed round timbers suitable for preparation into SEC poles
(11) Unprocessed round timbers suitable for preparation into mine support timbers
(12) Mature Chiplogs
(13) Regrowth Chiplogs
(14) Charcoal logs
(15) Medium sawlogs (for Moniers batten mill, Busselton)
(16) Medium sawlogs (for Whittakers ARI mill, Greenbushes)
(17) Regrowth sawlogs (karri or marri for Bunnings, Pemberton)
(18) Regrowth sawlogs (jarrah for Valwood)
(19) Sheoak sawlogs
(20) Non-engineering grade rounds ("fencing material")
(21) Domestic firewood logs

(1) **Premium Grade Sawlogs**

Species: Any hardwood species as nominated in the relevant Contracts.

Dimensions :		
	length	- minimum 2.4m
	diameter	- minimum 400mm underbark
Shape :		logs will be straight
Quality :		a maximum of 15% by volume of defective wood is permissible, as assessed on the worst end face, provided the defective wood is confined to the centre or heart of the log. No other defect is permissible.

General : logs must be delivered to mill landing for water spray storage within 5 days of felling.

(NOTE: The Department's Chief Utilisation Officer, Mr Des Donnelly, has written some guidelines to assist Forest Officers and Contractors to distinguish between "defects" and "features" or "characteristics" with respect to quality of premium grade sawlogs.)

(2) **First Grade Sawlogs** (jarrah, blackbutt and wandoo)

Species: jarrah, blackbutt and wandoo

Dimensions :

length	- minimum 2.1m
diameter	- minimum under bark 250mm (or 200mm to those customers who pay a reduced royalty)

Quality : - minimum amount of millable wood - 50% as assessed by the FOIC.

(3) **First Grade Sawlogs** (karri)

Species: karri

Dimensions :

length	- minimum 2.4m
diameter	- minimum under bark 300mm

Quality : - minimum amount of millable wood - 50% as assessed by the FOIC.

(4) **First Grade Sawlogs** (marri)

Species: marri

Dimensions :

length	- minimum 2.4m
diameter	- minimum under bark 300mm

Quality : - minimum amount of millable wood - 50% as assessed by the FOIC.

Note: because assessment of quality in marri is difficult, the following guidelines may be used when producing marri first grade sawlogs:

* smooth bark usually indicates acceptable sawlog quality.
* cross cutting should be carried out on bends, kinks and swellings where gum and loose rings are likely to occur.
* tight gum rings are acceptable.
* no more than two separate loose rings or shakes should be permitted, provided their combined length does not exceed 20% of the circumference of the log.

Note: in recent Contracts, marri sawlogs are not graded, but are sold simply as "Marri Sawlogs" at buyers' choice.

(5) **Second Grade Sawlogs** (jarrah, blackbutt and wandoo)

Species:	jarrah, blackbutt, wandoo
Dimensions :	
length	- minimum 2.1m
diameter	- minimum under bark 250mm
Quality :	- minimum amount of millable wood - 30% as assessed by the FOIC.

(6) **Second Grade Sawlogs** (karri and marri)

Species:	karri and marri
Dimensions :	
length	- minimum 2.4m
diameter	- minimum under bark 300mm
Quality :	- minimum amount of millable wood - 30% as assessed by the FOIC.

Note: in recent Contracts, marri sawlogs are not graded, but are sold simply as "Marri Sawlogs" at buyers' choice.

(7) **Third Grade Sawlogs**

Species:	Any hardwood species as nominated in the relevant contracts.
Specification:	CALM does not set any specification. Third grade sawlogs are logs that do not meet the second grade sawlog specification. Selection of third grade sawlogs is the responsibility of the log buyer.

(8) **Veneer Logs**

Veneer, or peeler, logs are prepared from high quality jarrah or karri logs according to the specification below:

a)

Diameter	Jarrah	Karri Old Growth	Karri Regrowth
Minimum:	310mm	500mm	350mm
Maximum:	650	1305	1305

b) Length
As nominated by the customer, with tolerance of +100mm. Ends to be cut square.

c) Rot - Not acceptable except at core. Specifications as for (e) below.

d) Heart - may be up to 120mm out of centre provided that the heartwood will be covered by the lathe chuck. Chuck sizes are 120mm for small logs and 210mm diameter for large logs.

e) Pipe - not permitted.

f) Borers, Pinholes - not permissible.

g) Shakes - Radial falling shakes, ring shakes and loose rings not acceptable. Star shakes acceptable so long as there is no associated rot and the shake diameter is not more than one half of the log diameter.

h) Shape - all logs to be reasonably cylindrical.

i) Limbs - sap limbs only are permitted.

j) Dry Sides - recent dry sides acceptable where the dry wood and checks are not more than 50mm in depth.

k) Gum - logs having large swellings indicating large pockets of gum not suitable. Gum rings are not acceptable but small gum pockets up to two per log face are acceptable.

l) End Coating - All logs to be coated both ends with petroleum jelly or some other suitable end coating to prevent end checking. Gang nail plates supplied by WESFI are to be fitted by the contractor to both ends of peeler logs immediately after preparation to assist in controlling end splitting.

(9) **Unprocessed Round Timbers Suitable for Preparation into Bridge and Jetty Timbers**

Species:	jarrah, bark on or bark off.
Dimensions:	
Length -	As required by the customer, but normally stringers are between 6.3m and 8.2m, piles are between 6m and 20m, and corbels are a standard 1.5m.
Diameter -	As required by the customer, but normally stringers are between 520mm and 650mm underbark, piles are between 300mm and 700mm underbark, and corbels are between 480 and 530mm underbark.
Shape:	Logs for preparation into bridge and jetty timbers must be essentially straight and of uniform but minimal taper.
Quality:	Logs for preparation into bridge and jetty timbers must be essentially of sound wood, free of termite attack, internal rot pockets and heart rot. Acceptable defects include tight gum rings, included sapwood at the butt end, minor end splits or shakes, and some sound knots.
General:	Logs must be delivered to the preparation site as soon as possible after felling to avoid insect and fungal attack.

Note: This specification is based on MRD specification No. 1261 of October 1986 for Supply of Untreated Round Timber and Department of Marine and Harbours specification for Supply of Timber Piles issued in March 1986.

(10) **Unprocessed Round Timbers suitable for Preparation into SEC Poles**

Species:	Jarrah, Marri, Blackbutt, Karri, Yellow Stringybark, radiata pine, or pinaster pine, - bark on or bark off.
Dimensions:	
Length -	Minimum 9.5m, then increasing in 1.5m increments to a maximum of 21.5m.
Diameter -	Limits vary depending on the pole length, but range from a minimum of 150mm at the crown end for 9.5m poles to a maximum of approximately 700mm at the butt end for 21.5m poles.
Shape:	Logs for preparation into SEC poles must be sufficiently straight such that an imaginary line from the centre of the crown end to the centre of the butt end at the "groundline" remains within the confines of the log.
Quality:	Logs for preparation into SEC poles must be essentially of sound wood, free of termite attack, internal rot pockets and heart rot. Radiata and pinaster pine must be entirely free of fungal and blue stain attack. Acceptable defects include minor insect damage, minor mechanical damage, some surface checking, sound knots, spiral grain up to a maximum of 1 in 15, tight gum veins and minor end splits.
General:	Logs must be delivered to the preparation site as soon as possible after felling to avoid insect and fungal attack. Radiata and pinaster pine must be delivered within eight days of felling; karri and yellow stringybark within five days of felling.
Note:	This specification is based on SECWA pole specifications ES/39/86 (1987 revision), ES/37/86 (1987 revision), ES/8/99 and ES/11/89 (May 1989 revision).

(11) **Unprocessed Round Timbers suitable for Preparation into Underground Mine Support Timbers**

Species: Jarrah, bark on or bark off.

Dimensions:

Length - As required by the customer, but normally between 1.8m and 6m.

Diameter - As required by the customer to match the nominated lengths, but normally between 125mm and 200mm.

Quality:

Acceptable Defects:

* Slight bends, provided the resulting mining timber does not deviate by more than half the crown diameter through the length of the individual mining timber.

* Double heart in the crown end, provided the heart centres are not separated by more than 33% of the diameter.

* Insect and mechanical damage, provided it is confined to the sapwood.

* Sound and tight knots, provided they do not exceed 20% of the log circumference measured immediately above the knot.

* Tight gum rings or veins.

* Included sapwood and gum pockets, provided they do not exceed 12mm in radius or 100mm in circumference.

* Minor surface checks.

Unacceptable Defects:

* Rot in any shape or form.

* Splits, shakes or popped wood.

General: Logs will generally be supplied in bole length and must be delivered to the preparation site freshly felled, that is within two weeks of felling.

Note: This specification is based on the specification for prepared mining timbers as written for mining timbers supplied to Western Collieries Ltd.

(12) **Mature Chiplogs**

Species: marri and karri

Dimensions :

Marri: length: minimum 3.4m
diameter: minimum under bark 230mm

Karri: length - minimum 2.1m
diameter - minimum under bark 150mm

Quality : The following defects are not permitted:

* charcoal in any form or quantity
* sharp kinks
* rot extending more than 50% of end face diameter
* saw cuts (test cuts) in logs greater than 900mm diameter

The following defects are permitted within the limits shown:

* double heart
* limbs which protrude less than 75mm from the stem
* curved logs provided the maximum deviation from straight does not exceed 150mm in any 3m length
* saw cuts (test cuts) in any log less than 900mm in diameter
* end face shatter of 50% in logs under 900mm in diameter.

(13) **Regrowth Chiplogs**

Species: marri and karri

Dimensions:
length: minimum 2.1 metres
crown diameter: minimum 75mm under bark - bark on

Defects: The following log defects **are permitted:**

* Knobs and overgrowths which protrude less than 75mm above the log surface
* Log sweep and bends if the log will pass through the debarker at Diamond Mill without interfering with production.

The following log defects **are not permitted:**

* Attached limbs and epicormics 20mm or greater in diameter at the log surface
* Charcoal affected wood
* Sharp kinks
* Rot extending more than 50% of log volume
* Saw cuts (test cuts)
* Forked marri logs
* Spurs and overgrowth that cannot be debarked
* Knobs and overgrowth, in excess of 75mm above the log surface
* Limbs in excess of 25mm above the main stem

(14) **Charcoal Logs**

Species: jarrah, bark on or bark off.

Moisture content : any moisture content, ie, "green" or "dry".

Dimensions:

length: minimum 1.8m
maximum as nominated by customer (currently 6.0m)

diameter : minimum underbark 150mm
maximum underbark 1200mm

Preparation : Lateral projections (branches, limbs, bumps) must not exceed 150mm.

Ends must be cut roughly square, and must consist of at least 50% by area of wood in one continuous piece.

Acceptable defects:
The following log defects are acceptable, provided the log can be safely handled and transported.

* double heart
* charcoal
* pin holes
* shakes and splits
* dead wood
* gum in any form
* bends: up to a maximum of 200mm in any 3m length
* rotten wood up to a maximum of 25% as assessed by area of rot visible on worst end.
* pipe

Unacceptable defects:
The following defects are not acceptable:

* visible evidence of termite activity
* shattered wood

(15) **Medium Sawlogs** (for Monier's batten mill, Busselton)

Species: karri and marri

Dimensions :

length : minimum 2.4m
(Some logs of length greater than 7m may be supplied, but no logs between 5 and 7m may be supplied)

diameter : minimum under bark 200mm
maximum under bark 800mm
(Mostly between 200 and 300mm)

Quality : As set by the FOIC, but using the following quidelines:

* sweep - maximum 50mm in any 2.4m length
* rot - maximum 30% on worst end face
* limb stubs, bumps - maximum of one per lineal metre
* dryside - maximum of 50% of bole circumference
* pinholes - clean only, unacceptable if associated with rot
* swellings - large swellings unacceptable
* gum rings - maximum of one complete ring on end face.
* gum pockets - maximum of one per lineal metre
* logs greater than 300mm diameter must meet specification for karri first grade sawlog

(16) **Medium Sawlogs** (for Whittakers ARI mill, Greenbushes)

Species: karri

Dimensions: minimum SED - 200mm under bark
minimum length - 3.0 metres

Quality:

1. Millable wood:

[a] For end diameters less than 300mm
Minimum amount of millable wood - 90%

[b] For end diameters greater than 300mm
Minimum amount of millable wood - 50%

2. Sweep:

Shall not exceed 50mm in any 3.0m length from log surface to the chord created by a straight edge or tight cord over the length of the log. Logs shall otherwise be of uniform shape.

3. Gum rings:

Maximum of 1 complete ring on end face.

4. Limb stubs, bumps:

Maximum of 1 per lineal metre.

5. Pinholes:

Clean only; unacceptable if associated with rot.

(17) **Regrowth Sawlogs** (for Bunning's Pemberton mill)

Species: karri and marri

PART A:

Dimensions :

length : minimum 2.4m
diameter : minimum 200mm

Quality :

* sweep shall not exceed 30mm from log surface to the cord created by a straight edge or tight cord over the length of the log. Logs shall otherwise be of uniform shape.
* fungal decay not acceptable
* double heart, limbs, overgrowths, drysides, shatters and saw cuts other than superficial not acceptable
* borer damage, shakes and gum veins should be present to a negligible extent only.

PART B:

Dimensions :

length : minimum 2.4m
diameter : minimum 150mm

Quality :

* sweep shall not exceed 15mm from log surface to the chord created by a straight edge or tight cord over the length of the log.
* logs shall have smooth clean surface and be of uniform shape
* fungal decay not acceptable
* double heart, limbs, overgrowths, drysides, saw cuts other than superficial, borer damage, shakes, gum veins, shatters, epicormic growths and overgrowths are not acceptable

(18) **Regrowth Sawlogs** (For VALWOOD)

Species:	jarrah, karri and marri
Dimensions :	
length	minimum 0.9m
diameter	min. 200mm underbark max. 400mm underbark
Shape :	- bend are acceptable provided minimum of 0.9m of straight log available between bends and provided a maximum of 5% of any log is wasted when cutting out the bends at the mill.
Quality :	Defective wood will be limited to 20% of the large end and 10% of the small end.
General :	Logs will generally be supplied in bole lengths and must be delivered to mill landing for water spray storage within 5 days of felling.

(19) **Sheoak Sawlogs**

Species:	WA Sheoak (Allocasuarina fraseriana)
Dimensions :	
length	minimum 0.9m
diameter	minimum 200mm under bark
Shape :	bends are acceptable provided a minimum length of 0.9m of straight log is available between bends, and provided no more than 5% of any log is wasted when cutting out the bends at the mill.
Quality :	a maximum of 15% by volume of defective wood is permissable, as assessed on the worst end face.
General :	logs will generally be supplied in bole lengths and must be delivered to the mill landing within 5 days of felling.

(20) **Non-Engineering Grade Rounds** ("fencing material")

Species:	jarrah, marri, blackbutt, wandoo or any other hardwood species made available by CALM and acceptable to the buyer
Dimensions :	any dimension acceptable to the buyer but generally:
length:	minimum 1.8m maximum 6.0m
diameter:	minimum under bark 100mm maximum under bark 300mm for rounds maximum under bark unlimited for logs suitable for splitting or sawing into posts

NOTE: Logs suitable for splitting will generally be supplied in standard post length, or multiples thereof. Logs for use in the round will generally be supplied in whole tree lengths.

Quality :

For Rounds:
any quality acceptable to the buyer, but generally:

* straightness - maximum deviation of 50mm in any 1.8m length
* double heart - acceptable
* deadwood - acceptable if not associated with decay
* pin holes - acceptable if not associated with decay
* decay - unacceptable
* shattered wood - unacceptable
* gum - acceptable

For logs suitable for splitting into posts:

Any quality provided the log is below the standard of a first grade jarrah sawlog. (The specification for a first grade jarrah sawlog is minimum diameter 250mm, minimum length 2.1m and minimum quality of "at least 50% of millable wood as assessed by FOIC").

(21) **Domestic Firewood Logs**

Species: jarrah, or any other species acceptable to the buyer

Moisture Content : Either [a] the logs will be predominantly "bush dry" ie. logs will be ex standing dead trees with most bark absent, or from logs that have been lying on the ground for at least three years; **or [b]** the logs will be approximately 50% "bush dry" and 50% "green".

Dimensions :
length: minimum 1.8m
diameter: minimum under bark 150mm
maximum under bark 1200mm

Unacceptable Defects :

* decayed wood, if the proportion by volume is greater than 15%.
* shattered wood
* double heart or spiral grain likely to hinder manual splitting of sawn blocks

SECTION 6 - LOG SPECIFICATIONS AND QUANTITY DETERMINATION

SPECIFICATION 6.3 SOFTWOOD LOG SPECIFICATIONS

Standard specifications for all softwood log products are reproduced below. These specifications may be used as a general reference by Forest officers and contractors, however, because there may be small but significant variations to some specifications in some Contracts to Supply and Contracts of Sale, the specifications in those Contracts must be checked and used as the official specification in every case.

The standard specifications reproduced below are:

(1) Peeler logs
(2) Industrial wood for Particle board
(3) Industrial wood for medium density fibreboard
(4) First class sawlogs
(5) Second class sawlogs
(6) Third class sawlogs
(7) Small sawlogs
(8) Sawlogs for Wespine (scanner measured)
(9) Rounds for treatment
(10) SEC poles

(1) **Peeler Logs**

Species:	Radiata or pinaster pine
Destination :	For supply to Wesfi Pty Ltd, Victoria Park.
Preparation:	Logs shall be freshly cut, square docked at both ends and have all branches flush trimmed.
Dimensions :	
length	Variable up to 2.56 metres and nominated by buyer. Tolerance will be nominal to +50mm.
diameter	Small end under bark not less than 350mm.
Defects :	The following log defects are not permitted:

* Blue stain
* Abrupt changes in diameter
* Massive knot whorls
* Individual dead knots exceeding 6cm in diameter

The following log defects are permitted to the limits shown:

Dead or decayed knots or knot holes up to 3 per whorl, biggest not to exceed 40mm in diameter on greatest axis.

No more than 1 whorl of cone holes in any length.

Sweep shall not exceed 20mm in any peeler length, measured from log surface to the chord created by a straight edge or tight cord.

Pith shall not be off centre at the small end by more than 20% or at the butt end by more than 25% of the smallest axis diameter.

Burnt bark provided the timber has not been affected.

End coating: during the months January, February and March logs shall be end coated within two days after preparation and extraction to the break.

Identification: logs shall be end marked on one end with blue crayon to record the diameter class.

2nd Class Peelers : Logs prepared in good faith to the peeler specification but not to standard will be supplied as 2nd class peelers at a reduced stumpage, and will be identified by marking P2 on one end of the log.

(2) **Industrial wood for Particle Board**

Species: Radiata or pinaster pine

Preparation : Logs shall be freshly cut and have all branches flush trimmed. Logs shall be removed from the plantation within five days of cutting.

Dimensions : Diameter: minimum 75mm u.b.
maximum 350mm u.b.

Length: 5.4m only

Defects : The following log defects are not permitted:

* Blue stain
* Abrupt changes in diameter
* Sharp kinks
* Massive knot whorls

The following log defects are permitted to the limits shown:

Cone holes as they occur.

Bent or curved logs if they will pass through the barkers at Dardanup without interfering with production.

The moisture content of logs at the time of delivery shall not be less than 75%.

Burnt bark provided the timber has not been affected.

(3) **Industrial wood for medium density fibreboard**

Species: Pinaster or radiata pine.

Preparation : Logs shall be freshly cut and have all branches flush trimmed. Logs shall be removed from the plantation within five days of cutting.

Dimensions :

length: A minimum of 4m ranging to a maximum of 5.4m.

diameter: Small end under bark not less than 75mm. Large end under bark shall not exceed 350mm.

Defects : The following log defects are not permitted:

* Blue stain
* Abrupt changes in diameter
* Sharp kinks
* Massive knot whorls

The following log defects are permitted to the limits shown:

Cone holes as they occur.

Bent or curved logs if they will pass through the debarker without interfering with production.

Burnt bark provided the timber has not been affected.

(4) **First Class Sawlog**

Species: Radiata or pinaster pine

Preparation : Logs shall be freshly cut flush trimmed and square docked. Butts will be supplied as cut with sloven and withdrawn slivers but generally free from falling splits and shakes. The sloven will not be tallied in the length.

Dimensions :

length:
A minimum of 4.8m with increments of 0.3m plus overcut for board docking. Tolerance will be from +20mm to +50mm.

diameter:
Small end under bark not less than 300mm. Logs with small end under bark not less than 200mm and not greater than 290mm shall be graded as Second Class Pine Sawlogs.

age:
A minimum age of 25 years.

Defects :

The following log defects are not permitted:

* Blue stain
* Abrupt changes in diameter
* Massive knot whorls

The following log defects are permitted to the limits shown:

Individual dead knots not to exceed 60mm in diameter on greatest axis.

Sweep shall not exceed 20% of the small end diameter under bark in any 3.0m length measured from log surface to the chord created by a straight edge or tight cord.

Burnt bark provided that the timber has not been affected.

(5) **Second Class Sawlog**

Species: Radiata or pinaster pine

Preparation : Logs shall be freshly cut trimmed and square docked. Butts will be supplied as cut with sloven and withdrawn slivers but generally free from falling splits and shakes. The sloven will not be tallied in the length.

Dimensions:

diameter

(A) For logs 2.1m to 3.3m in length, small end under bark not less than 250mm.

(B) For logs 3.6m and longer, small end under bark not less than 200mm.

length

(C) For short logs of minimum age 18 years - a minimum of 2.1m with increments of 0.3m to 4.5m.

(D) For young long logs of age 18-24 years - a minimum of 4.8m with increments of 0.3m.

tolerance

Tolerance will be from +20mm to +50mm for board docking.

Defects :

The following log defects are not permitted:

* Blue stain
* Abrupt changes in diameter
* Massive knot whorls

The following log defects are permitted to the limits shown:

Individual dead knots not to exceed 60mm in diameter on greatest axis.

Sweep shall not exceed 20% of the small end diameter under bark in any 3.0m length measured from log surface to the chord created by a straight edge or tight cord.

Burnt bark provided that the timber has not been affected.

(6) **Third Class Sawlogs**

Species: Radiata or pinaster pine

Specification : CALM does not set any specification. Third Class Sawlogs are logs that do not meet the First or Second Class Sawlog specification. Selection of third class sawlogs is the responsibility of the log buyer.

(7) **Small Sawlogs**

Species: Radiata or pinaster pine

Preparation : Logs shall be freshly cut flush trimmed and square docked. Butts will be supplied as cut with sloven and withdrawn slivers but generally free from falling splits and shakes. The sloven will not be tallied in the length.

Dimensions : length:
2.1m, 2.4m, 2.7m, 3.0m and 3.3m. Tolerance from nominal to +50mm

diameter:
Small end under bark: 150mm to 250mm.

Defects : The following log defects are not permitted:

* Blue stain
* Abrupt changes in diameter
* Massive knot whorls

The following log defects are permitted to the limits shown:

Dead knots less than 50mm diameter on greatest axis.

Sweep shall not exceed 20% of Small End Diameter Under Bark along the total length measured from log surface to the chord created by a straight edge or tight cord.

Burnt bark provided the timber has not been affected.

(8) **Sawlogs for Wespine** (with scanner measurement and stumpage based on mid diameter)

Species:	Radiata or pinaster pine
Preparation :	Logs shall be freshly cut flush trimmed and square docked. Butts will be supplied as cut with sloven and withdraw slivers but generally free from falling splits and shakes.
Dimensions :	Length: A minimum of 2.40 metres with increments of 0.3 metres with a minimum overtrim of 50mm. Diameter: Minimum of 200mm small end diameter under bark.
Age:	A minimum of 18 years.
Defects :	The following log defects are not permitted: * Blue stain * Abrupt changes in diameter * Massive knot whorls The following log defects are permitted to the limits shown: Individual dead knots not to exceed 60mm in diameter on greatest axis.
Grade:	As provided in Clause 22[b].

(9) **Rounds for Pressure Treatment**

Species:	Radiata or pinaster pine
Preparation :	Logs shall be freshly cut square sawn at both ends, all branches flush trimmed and not display marked variations in diameter over the length.
Dimensions :	length: From 1.8m upward in 0.3m increments to a maximum of 4.8m. Tolerance will be nominal to +50mm for 1.8m and -50mm to +50mm for all other lengths. diameter: Small end under bark 70-200mm. Supply will be in any range of diameters of 40mm or greater.

Defects :

The following log defects are not permitted:

* Fractures
* Dry sides
* Overgrowths
* Unsound knots
* Termite damage
* Clusters of cone holes
* Insect damage other than limited superficial bark borer
* Fungal decay (except blue stain)
* Axe or saw cuts other than superficial and bearing in mind end use.

The following log defects are permitted to the limits shown:

Blue stain: limited so as not to interfere with the treatment process.

Limbs & Spurs: shall protrude not more than 5mm above the bark.

Sound knots: except when in a whorl or located such as to impair seriously the strength of the pieces.

Cone Holes:		
Distance apart of Whorls	Small end diameters 120mm or less	> 120mm
Less than 1m	1 hole/whorl	1 hole/whorl
1m or more	2 holes/whorl	3 holes/whorl + 1 for every 40mm of additional diameter
Sweep -	The maximum allowable sweep in length measured from log surface to a chord created by a straight edge or cord at the points of greatest deviation will be:	
SED	Sweep per metre of length	
Less than 120mm	8mm	
120mm or more	10mm	

Burnt bark provided the timber has not been affected.

Variation from Specification :

A tolerance up to 5% variation from the above specification in any one parcel is to be accepted.

6-15% departure from specification - faulty material will be replaced.

Over 15% departure from specification - whole parcel will be replaced.

(10) **Unprocessed Round Timbers suitable for Preparation into SEC Poles**

See product type number 10 in Specification 6.2.

SECTION 6 - LOG SPECIFICATIONS AND QUANTITY DETERMINATION

SPECIFICATION 6.4 MINOR FOREST PRODUCTS

The following list of minor forest products may be sold under pre-paid Forest Produce Licences using the appropriate, up-to-date royalty, in-forest and roading charges (refer Schedule of Royalties/stumpages, effective 1 January 1992). CALM Briefing Paper 2/91 (updated 1 July 1992) provides detailed information for the public, and explains CALM's Policies regarding sale of common minor forest products in the south west.

1. **Feature Sawlogs**

Feature sawlogs include high value logs available in relatively small quantities only such as "curly" jarrah, sheoak, karri oak, river banksia, bull banksia, peppermint and Warren River cedar.

Feature sawlogs are available for sale from clearfell cutting areas only, or from opportunistic clearing such as SEC line clearing or road widening operations.

2. **Craftwood**

"Craftwood" is a term used to describe any piece of wood (except burls) remaining on the forest floor after the completion of integrated logging operations. A piece of craftwood is generally small in size, but with certain features of grain, colour or shape that make it suitable for manufacture into craft items. Craftwood also includes items on the forest floor such as banksia nuts, blackboy roots and hollow logs. The issue of a Forest Produce Licence for collection of Craftwood is not intended to allow members of the public to establish a sawmilling business in the conventional sense, hence a length limit of 1.5m on any single piece of wood collected is a condition of a Forest Produce Licence issued for collection of Craftwood. If a longer piece of timber is required and found, it must be inspected and branded by a Forest Officer before it can be collected as craftwood.

3. **Domestic Firewood**

Commercial sale of domestic firewood from State forests using the pre-paid Forest Produce Licence has been phased out in CALM's Swan Region and parts of the Central Forest Region, but is still permitted elsewhere. Any timber lying on the ground may be sold as firewood, provided it cannot be sold as a higher value product. Standing dead trees may be felled, subject to feller certification rules, again provided such trees cannot be sold as higher value products.

A standard specification for domestic firewood when sold under Contract of Sale is included in Specification 6.2.

Members of the public may collect small quantities of firewood for their own use without any special written authority. Only ground salvage material however may be collected, up to a maximum of approximately 0.5 tonne per trip. Where "Public Firewood Areas" exist, the public is encouraged to use such areas.

4. **Non-Engineering Grade Rounds**

Non-engineering grade rounds include a range of products used for fencing purposes or for small domestic construction. They include posts (split or round), struts, strainers, rails and small poles up to 6m in length. Chopping logs are also included in this category.

Non-engineering grade rounds are sold by weight. As a guide, approximately 26 standard sized split jarrah fence posts weigh one tonne.

A standard specification for non-engineering grade rounds when sold under Contract of Sale is included in Spec 6.2.

5. **Garden Paving Slabs and Rings**

These are rings, about 75mm thick, cut from logs about 400mm in diameter. Logs from which garden rings are cut are sold as third grade sawlogs.

6. **Burls**

Burls are dense outgrowths on the side of trees. It is thought they result from a tree's reaction to attack from insects or viruses. Burls may be cut from felled trees only, and are sold by weight.

7. **Garden Sticks**

"Garden Sticks" (sometimes known as "swamp sticks") includes all types of long, thin stems of various species of Melaleuca or Leptospermum which are cut for use in market gardens as plant supports, or to make craypots. Garden sticks are sold by the tonne.

Sticks used in market gardens (commonly known as "Bean Sticks") are generally about 2.5m long and 30mm in diameter. About 1000 standard sized garden sticks weigh one tonne.

Sticks used for craypots are usually about 1.2m long and 10mm thick. About 5000 of these smaller sticks weigh one tonne.

8. **Forest Debris**

Leaves, needles, branches, tree loppings or small cull trees may be supplied free of charge to Shires or other Government organisations for purposes such as sand dune restoration work, and to domestic users. Commercial users must pay royalty, in-forest and roading charges as prescribed per tonne.

SECTION 6 - LOG SPECIFICATIONS AND QUANTITY DETERMINATION

SPECIFICATION 6.5 DETERMINATION OF LOG TIMBER QUALITY

1. Part 7 and Schedule 1 of the Forest Management Regulations 1993, published 9 February 1993, detail the requirements for the determination of log timber quantity.

2. In summary, these Regulations require:

   [a] the person responsible for determining the quantity of any log timber to immediately record the quantity on the log delivery note, or, if the quantity is printed on a weighbridge ticket, to immediately attach that ticket to the log delivery note, and

   [b] the owner or manager of a sawmill to ensure that no log timber ex State forest or Timber Reserve is stored or processed at his sawmill unless the quantity has been determined and recorded.

3. Schedule 1 of the Forest Management Regulations 1993 details the five recognised methods for determining the quantity of log timber, viz:

   [a] volume of hardwood log timber by individual log measurement;

   [b] volume of softwood log timber by individual log measurement;

   [c] quantity of log timber by weighing;

   [d] volume of log timber by bin measure, and

   [e] volume of log timber by infra-red log scanner.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.1 SALE OF LOG PRODUCTS

1. There are two ways in which log products may be sold :

   i) Contract of Sale (either credit or pre-paid) - authorized by S.O.H.Q.

   and

   ii) Forest Produce Licence (pre-paid) - authorized by Districts.

2. Contracts of Sale may extend for periods up to 15 years. In most cases, payment for logs is made after delivery by a CALM employed logging contractor. In these cases the customer must have lodged security in the form of a cash deposit or a bank guarantee.

3. The Forest Produce Licence (form CLM165) may be used by Districts to sell minor forest products, including "Craftwood". All products sold under a F.P.L. must be paid for in advance.

4. Mill Returns

   4.1 All buyers of log timber under Contract of Sale are required to submit, to the CALM District Office, a Log Timber Receival Record on form CLM 183. The CLM183 is produced in book form; instructions for completion of the form are printed on the book cover. (Refer also to Part 8 of the Forest Management Regulations, 1993.)

   4.2 All registered mills must, in January and July of each year, submit a return to CALM's State Headquarters on form CLM182, being a "Summary of Milling Operations" for statistical purposes.

5. Simultaneous Operations on Crown Lands and Private Property

   If a buyer of log timber under Contract of Sale wishes to cut timber from private property and Crown Lands simultaneously, he must apply for permission to do so by writing to the relevant CALM District Manager (FOIC). The letter must state the location numbers from which the timber is to be obtained, the names of the owners, PP brands, estimated volumes, the names of logging operators to be engaged in the work, and the dates during which the work is to take place.

   Assuming permission is given to operate simultaneously, the above information will enable District procurement staff to monitor log haulage in their District, and efficiently carry out mill landing inspections.

   All deliveries of private property timber to a crown land mill must be recorded on a Private Property Log Delivery Note issued by CALM.

6. Royalty-Free Timber

   The only timber product that can be taken from State forest free of any royalty charge is firewood from the forest floor for private domestic use. (See also Specification 6.4.) Any request for royalty-free timber from sporting or charitable organisations must be referred in writing, with recommendation, to the Executive Director.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.2 T.I.R. ACT AND REGISTRATION OF MILLS

1. The Timber Industry Regulations Act (1926-1969) provides regulations to ensure the health and safety of personnel involved in the timber industry. The regulations cover all components of the timber industry from log harvesting to log transport to log milling and primary processing, and log preservative treatment.

2. The T.I.R. Act and Regulations are enforced by District Inspectors who now work under a Controlling Officer from the Department of Occupational Health Safety and Welfare. These inspectors are based at Bunbury and Manjimup and may be contacted for advice or assistance by any Forest Officer or logging contractor on matters related to health and safety in the timber industry.

3. Forest Officers are required to have a reasonable knowledge of the T.I.R. Act and Regulations, and the Occupational Health Safety and Welfare Act. Forest Officers must inform a District Inspector of any unsafe machinery, working conditions or work methods which are likely to lead to accidents. Forest Officers must also assist District Inspectors in obtaining prompt compliance with the provisions of the T.I.R. Act.

4. Registration of Mills

   Every mill used in the timber industry must be registered under and in accordance with the regulations made under the T.I.R. Act. Applications for registration must be made on the prescribed form, available from CALM's SOHQ. Registration is effected upon issue of a certificate with effect for the year ending 31 December.

   Mills not requiring registration include sawmills or benches belonging to farmers or hobbyists not involved in cutting timber for sale or profit.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.3 L.O.I.S.

1. "L.O.I.S." is the Department's "Logging Operations Information System", a computer system designed to handle the data processing and recording requirements for all aspects of CALM's hardwood and softwood logging activities.

2. The system is described in a number of documents :

   i) LOIS Reference Manual (a comprehensive loose leaf folder describing the system in detail for audit requirements).

   ii) LOIS System Codes (an A5 sized loose leaf folder containing all computer codes required to use the system)

   iii) Field Officers Guide to LOIS

   and

   iv) District Clerical Officers Guide to LOIS

   } (Small booklets designed to assist users of the system)

   CALM Staff dealing with LOIS must have access to these documents.

3. Initiation of a Contract of Sale in LOIS

   Before a sale of log timber can occur, the computer system must be loaded with information about the sale. This is done at SOHQ via the "Initiation of Timber Sale Document" (form CLM216). This is a two page form summarizing essential information about a Contract of Sale. Information from the CLM 216 must be entered into LOIS by SOHQ before (i) the Logging Operation Prescription form (CLM709) can be completed and (ii) before production and/or deliveries can commence.

4. Logging Operation Prescription

   The Logging Operation Prescription form (CLM709) must be completed by Districts, and input into LOIS by Regions, before cutting can commence. The CLM709 provides the computer with base information about each logging operation in the field.

   Before the start of each logging year, it is advisable that District Staff and Regional Inventory staff meet to jointly prepare all CLM709 forms to cover all planned operations for the forthcoming year. Changes to 709 forms during the year must be authorized by the FOIC or the FOIC's nominated representative.

5. Delivery Notes

   The key to recording movement of log products is the Delivery Note. This is a one page document (in quadriplicate) which must be completed for each and every truck load of logs carted from State forest or any other land on which CALM manages the logging operation. If two different log products are carted at one time, two D/Notes must be completed, one for each product.

   All payments to contractors and invoices to customers are based on the original copies of the Delivery Notes, therefore great care must be taken, by truck drivers in particular, to neatly and correctly complete all relevant parts of the D/Note before leaving the bush landing or plantation roadside. Failure to do so is a serious offence.

Detailed instructions for completion of D/Notes are written on the inside front cover of every D/Note book. Damaged D/Notes must be kept in D/Note books, and completed books must be promptly returned to a CALM office, preferably the office from which the books were issued.

Forest officers must regularly check D/Notes in the field to ensure correct procedures for their completion are being followed. 5% of all D/Notes originating in any one District must be checked each month.

For deliveries of logs from private property by logging contractors not employed by CALM, a "private log" delivery note must be used. This D/Note is also used to authorize transfer of logs from one mill to another and other situations not involving a monetary transaction with CALM.

All original D/Notes, after processing by CALM, must be promptly forwarded to SOHQ on a monthly basis with the appropriate "Monthly Mill Intake Summary" sheets (CLM 183).

6. Signing of Delivery Notes

There are spaces on Delivery Notes for four signatures:

i) Contractor: there must always be a contractor's signature, normally that of the truck driver who is employed by the harvesting contractor. If however the delivery of the logs is the responsibility of the customer, then the loader driver or some other representative of the harvesting contractor must sign the D/Note as the contractor.

The contractor's signature which must be completed before the truck leaves the bush landing, is in effect stating that all details written on the D/Note at that stage are accurate and correct.

ii) Customer: there must always be a customer's signature, normally that of the loader driver at the customer's mill landing. Before signing the D/Note however, the customer's representative must agree with all details written on the D/Note by the contractor, in particular the product species and type, the date, and the number of logs (for individual log volume measure).

If there is any discrepancy requiring alteration, both parties (the contractor and the customer) must initial the alteration, without obliterating the original details.

If the delivery of the logs is the responsibility of the customer, then the truck driver, who is either directly or indirectly employed by the customer, must sign the D/note, at the bush landing, on behalf of the customer. Again, any discrepancy requiring alteration must be initialled by both parties.

iii) Forest Officer: a Forest Officer can check and sign a D/Note at the bush landing, whilst the truck is en route, or at the customer's mill landing. Audit regulations require at least 5% of all D/Notes from each CALM District to be checked and signed by a Forest Officer each month.

iv) CALM Coding Officer: every D/Note must be checked, coded and signed, ready for LOIS input.

7. Distribution of D/Notes

In principle, the copies of a D/Note must not be separated until all details, including the quantity of logs on the load, have been written on the D/Note, to the agreement of both the contractor and the customer.

Then, the four copies are distributed as follows:

i) Original (white) copy: CALM; This is the copy which is entered into CALM's computer system and upon which contractor payments and customer invoices are based.

ii) Duplicate (green) copy: Contractor.

iii) Triplicate (pink) copy: Customer.

iv) Quadruplicate (yellow) copy: stays in book as backup copy only.

In most cases, the original (white) copy must be handed by the truck driver to the customer's representative, for later collection by CALM. In some cases CALM may require the contractor to retain the original copy and hand it in to the CALM office in the District from which the logs were harvested.

The duplicate (green) copy is normally retained by the truck driver who is normally directly or indirectly employed by the harvesting contractor. If however the delivery is the responsibility of the customer, then either:

[a] the contractor's representative may take the duplicate (green) copy before the truck leaves the bush landing, OR

[b] CALM must arrange for a photocopy of the original copy of the D/Note to be forwarded to the harvesting contractor (the duplicate in this case being retained by the trucking company).

Completed D/Note books must be promptly returned to a CALM office, preferably the office from which the books were originally issued. New books may not be issued unless used books are returned.

8. LOIS Input Documents

Delivery notes are just one of the several types of Input Documents that are used to "update" LOIS. A list of all current Input Documents follows:

i) CLM823 Hardwood Log Delivery Note, used for logs measured individually.

ii) CLM821T Hardwood Log Delivery Note, used for logs measured by weight using a Toledo printer.

iii) CLM821A Hardwood Log Delivery Note, used for logs measured by weight using an Avery printer.

iv) CLM125C Round Timber Inspection Certificate, used for round timbers inspected by CALM.

v) CLM076 Log Credit Note, used for logs measured individually.

vi) CLM810T Log Credit Note, used for logs measured by weight using a Toledo printer.

vii) CLM810A Log Credit Note, used for logs measured by weight using an Avery printer.

viii) CLM100 Incorrect D/Note Adjustment Form, used to adjust incorrect volumes or tonnages or workcodes when discovered after the half monthly accounting period.

ix) CLM102 Hardwood Incorrect Rate/Price Adjustment (SOHQ use only).

x) CLM173 Private Log Delivery Note (Hardwood and Softwood) volume measure.

xi) CLM176 Private Log Delivery Note (Hardwood and Softwood) weight measure.

xii) CLM544 Softwood Log Delivery Note. (Volume or bin measure)

xiii) CLM821S Softwood Log Delivery Note, used for logs measured by weight using a Fagan printer.

9. Rates and Prices

The Timber Supply Branch of the Department produces and maintains, through LOIS, official Contractors' rates, and prices to customers.

Users of LOIS can access these rates and prices through LOIS.

Amendments to the rates and prices usually take place:

i) on 1 January and 1 July each year to accommodate CPI increases on contractor's rates, royalties, stumpages and standard Departmental logging charges.

ii) at any time to accommodate a general royalty/stumpage review.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.4 LOGGING AND LOG SALE CONTRACTS

1. There are two main types of contracts initiated by Timber Supply Branch :

   i) Contracts to Supply, and

   ii) Contracts of Sale.

1.1 Contract to Supply

This is where a logging company is contracted to CALM, to supply one or more types of forest produce from State forest or other land managed by CALM, and including private property, as planned and directed by CALM. In this case "supply" may involve one or more of the following:

i) "production" of the produce (ie, falling, extracting, preparation and sorting).

ii) individual log measurement on the bush landing.

iii) loading and

iv) hauling.

Contractors may be engaged by CALM by:

i) the acceptance of a tender after advertisement of a Contract to Supply, or

ii) by the acceptance of a quote requested by CALM for a specific task.

Contracts to Supply are numbered according to:

i) The year the contract was signed,

ii) The species of timber involved, and

iii) The number of the contract in that particular year. For example, Contract 92K4 was commenced in 1992, it involves karri, and it was the fourth contract signed in 1992. If more than one species is involved, the letter H, indicating hardwood, is used.

1.2 Contract of Sale

This is where a customer contracts to buy a specified quantity of forest produce from CALM. Produce sold under a Contract of Sale is usually supplied by a CALM contractor under a Contract to Supply. Contracts of Sale are entered into:

i) after an agreement is reached between a customer and CALM or
ii) after a specified quantity of produce is sold by auction or tender.

Contracts of Sale are identified by a three or four digit number.

In all Contracts of Sale the Department aims to recoup at least the following:

i) the cost of production and delivery (as per the Contract to Supply)
ii) a sum of money to cover administration of the Contract to Supply and the Contract of Sale.
iii) the Royalty or Stumpage for the produce
iv) a sum of money for roading,
v) a sum of money for "in-forest-costs" (for example, the costs of tree marking). and
vi) the cost of timber inspection by CALM Timber Inspectors (if applicable)

Attachment 7.4.1 is a copy of a proforma which CALM Districts or Regions may use to confirm agreed rates of delivery of logs to Contract of Sale customers.

Attachment 7.4.1

PROFORMA TO LOG CUSTOMERS
RE: AGREED REGULAR WEEKLY DELIVERY RATE

Dept of CALM
.....Office
.....Date

TO:

The Manager
.....
.....
.....

Dear Sir

RATE OF DELIVERY OF LOGS UNDER CONTRACT OF SALE.

Confirming discussions held on _____ between your _____ and CALM's _____ it is agreed that the regular weekly rate of delivery of logs under Contract of Sale No. _____ will be as follows:

MILL	PRODUCT	SUPPLY AREA	PERIOD FROM	PERIOD TO	WEEKLY QUANTITY

COMMENTS:

_____

_____

_____

Yours faithfully

.....

.....
FOR: DISTRICT/REGIONAL MANAGER

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.5 REGISTRATION OF TIMBER WORKERS AND IDENTIFICATION CODES

1. Parts 2 and 4 of the Forest Management Regulations 1993, published 9 February 1993, detail the requirements for [a] registration of timber workers, [b] registration of identification codes for persons who fell trees on State forests and timber reserves, and [c] identification of log timber removed from private land.

2. **Registration of Timber Workers**

2.1 In summary, the Regulations require that:

[a] all persons engaged in timber harvesting in a State forest or timber reserve, be resgistered through CALM. The only exceptions to this requirement are persons who operate under a Forest Produce Licence, or persons who collect public firewood.

[b] applications for registration be made on the approved CALM form (CLM 014).

[c] applications for renewal of registration be made on the approved CALM form (CLM 014A).

[d] the Executive Director of CALM keep a record of all persons registered as timber workers.

[e] any worker carry his or her registration certificate, or a copy, at all times whilst working on State forests or timber reserves, and produce the certificate for inspection by a Forest Officer or CALM officer when required.

2.2 Timber workers may be registered in one or more of several categories, as listed on the application form (CLM 014). Registration in any category is subject to evidence of appropriate qualifications. At present, appropriate qualifications in most timber worker categories are obtained through the Forest Industries Training Services, an organisation based at 10 Zoe Street, Bunbury which is recognised by both CALM and the Department of Occupational Health Safety and Welfare.

2.3 Registration in any particular category is classed as either [a] full, or [b] probationary. Full status means the applicant is able to produce documentary evidence acceptable to the Executive Director that a certain minimum skill level has been reached in the particular category. Full status can also be awarded, in categories where no formal training or testing has been developed, to applicants of "some standing" in the particular category.

Probationary status applies to applicants who are new to the job and in the process of being trained, or who are waiting to be formally tested. Probationary status should not extend beyond approximately six months, by which time a timber worker should be able to satisfy the requirements of full status. If not, the person's registration should be cancelled.

2.4 Registered timber workers will be invited by CALM to renew their registration each year. A notice will be sent by mail from CALM's SOHQ approximately two months before the annual expiry date for each individual timber worker.

2.5 Registration, or renewal of registration, can only be effected following receipt of the appropriate fee, currently $25, following which a "Certificate of Registration as a Timber Worker" is forwarded (CLM 430).

3. Identification Codes for Tree Fellers

In summary, the Regulations require that all persons who fell trees on State forest or timber reserve, including persons who operate harvesting machines which fell trees, be registered and given an "identification code".

These identification codes must then be recorded on Delivery Notes.

4. Identification of Log Timber Removed from Private Land

In summary, the Regulations require that:

[a] log timber felled on and removed from private land for processing at a sawmill be distinctly marked with an identification code unique to the owner or owners of that land.

[b] application for an "owner's identification code" be made by the owner or occupier of private land, or by any other person who intends to remove log timber from that land for processing at a sawmill, on the approved CALM form.

[c] the Executive Director of CALM register an approved "owner's identification code", upon receipt of the appropriate fee, currently $45.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.6 SUPPLEMENTARY CUTTING

1. From time to time quantities of sawlog, or other log product types, not included in a current logging plan, need to be harvested at short notice. For example, minesite clearing areas, clearing for public utilities, wildfire damage, or research cutting areas.

2. In these situations the District Manager must consider:

   i) the tenure and land use priorities of the area in question and
   ii) the estimated quantity of log product involved.

3. If logging is authorized on the area in question, a logging plan must be initiated by the District Manager and prepared and approved in the normal way prior to logging.

4. Log products from approved supplementary cutting areas should be sold to existing Contract of Sale customers as part of their annual log intakes. If the quantity of log timber is in excess of current requirements, the District Manager should advise the Manager, Timber Production Branch. The advice should include:

   i) the area and location of the resource,
   ii) the quantity and quality of log products involved,
   iii) if applicable, the name of the CALM logging contractor in best position to carry out the logging,
   iv) if applicable, potential customers to which the log products may be sold,
   v) a time scale of the proposed logging operation.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.7 MILL LANDING INSPECTIONS

1. Log landings at all mills receiving individually measured logs under Contract of Sale from CALM ("Crown Land" Mills) must be inspected by a Forest Officer. The inspections should be carried out at least twice per month, but not on the same days each month.

2. When applicable, the party responsible for measuring individual logs (either the customer or the CALM logging contractor) must record the following information on the end of each log measured :

   i) D/Note number
   ii) Log Number (for that D/Note)
   iii) Length
   iv) Diameter

3. At each inspection, the Forest Officer must check the measurements on about six logs on the landing. The measurements taken must be checked against the measurements previously recorded by the mill on the appropriate D/Note. The Forest Officer must initial and date the D/Note entries checked.

4. The Forest Officer must record his visit in the Log Timber Receival Record Book (CLM 183). This book is kept at each mill as a permanent record of all mill landing inspections. Any discrepancies, or departure from the correct procedure, with regard to numbering or measuring logs or the recording of measurements on the D/Notes, must be:

   i) recorded in the "Record Book" and
   ii) reported promptly to SOHQ via the District Manager and the Regional Office.

5. To check log measurements a Forest Officer must have a clear understanding of the method of measuring hardwood logs, as described in the CALM booklet: "Cubic Contents of Hardwood Logs". (1985).

6. Where a mill receives weight or bin measured logs under Contract of Sale from CALM, the above procedures do not apply. However, landing inspections must still be carried out and the mill log landing Inspection Record Book completed. During inspections at these mills the Forest Officer must check for:

   i) branding on logs.
   ii) separation of crown land and private property logs on the landing.
   iii) correct use of weighbridge or bin measuring equipment.
   iv) correct completion of D/Notes.

7. Below is a list of all current Crown Land mills at January 1993 (NB: excludes buyers of minor forest products such as domestic firewood and fencing material.)

(a) **Hardwood** - (Fixed)

	Company	Location of Mill	CALM District resp. for mill land. inspection
1.	Pickering Brook Sawmills	Pickering Brook	Mundaring
2.	Hamilton Sawmill	Osborne Park	Mundaring
3.	Jarrah Case Factory	Bayswater	Mundaring
4.	Ashfield Sawmill	Yokine	Mundaring
5.	Stefanelli Sawmill	Middle Swan	Mundaring
6.	Mountain Movers	Welshpool	Mundaring
7.	Kaleema Sawmills (Hollingsworth)	Malaga	Mundaring
8.	Wesfi (MDF mill)	Welshpool	Mundaring
9.	Inglewood Products Group	Malaga	Mundaring
10.	Bunnings	Jarrahdale	Jarrahdale
11.	Colli and Sons	Mundijong	Jarrahdale
12.	Wesfi (Veneer mill)	Victoria Park	Jarrahdale
13.	Coli Timber Merchants	Gosnells	Jarrahdale
14.	Dale Timber Co (Coli)	Dale River	Jarrahdale
15.	Timber Traders Cockburn	Spearwood	Jarrahdale
16.	Coli Timber Products	Dwellingup	Dwellingup
17.	Colli & Sons	Dwellingup	Dwellingup
18.	F Muller & Co	Wandering	Dwellingup
19.	W J & K Timber Co	Mandurah	Dwellingup
20.	Bunnings	Yarloop	Harvey
21.	C V Wood	Waroona	Harvey
22.	SIMCOA	Kemerton	Harvey
23.	W.U.R.C.	Harvey	Harvey
24.	Gordon & Son	Boddington	Harvey
25.	Bunnings	Collie	Collie
26.	Bunnings (Pole Dump)	Worsley	Collie
27.	G W & N L Saunders	Collie	Collie
28.	T Tilbrook	Collie	Collie
29.	S W Sawmill (Allen)	Waterloo	Collie
30.	Coli Timber Products	Darkan	Collie
31.	Whittakers	Greenbushes	Kirup
32.	Adelaide Timber Co	Wilga	Kirup
33.	Coli Timber Products	Argyle	Kirup
34.	Bedford Bros	Brookhampton	Kirup
35.	Blackwood Timber Milling (Holroyd)	Bridgetown	Kirup
36.	Bunbury Sawmill (Giovanetti)	Picton	Busselton
37.	K D Power	Busselton	Busselton
38.	P Colli & Son	Busselton	Busselton
39.	J House	Yallingup	Busselton
40.	IPE Packaging	Busselton	Busselton
41.	Adelaide Timber Co	East Witchcliffe	Busselton
42.	Monier Roofing	Busselton	Busselton
43.	Whiteland Milling	Busselton	Busselton
44.	Margaret River Sawmill (Rowe)	Margaret River	Busselton
45.	Clark Construction	Busselton	Busselton
46.	Bunnings	Nannup	Nannup
47.	R. Gilchrist	Alexander Bridge	Nannup

Company	Location of Mill	CALM District resp. for mill land inspection
48. Bunnings	Deanmill	Manjimup
49. Bunnings	Nyamup	Manjimup
50. Bunnings	Jardee	Manjimup
51. Gandy Timbers	Jardee	Manjimup
52. Bunnings	Diamond	Manjimup
53. Yornup Mill (Holdsworth)	Yornup	Manjimup
54. Worsley Timber Co	Palgarup	Manjimup
55. S F & P J Contracts (Tink)	Manjimup	Manjimup
56. Smithbrook Milling (Mitchell)	Manjimup	Manjimup
57. Middlesex Sawmills (Drake)	Middlesex	Manjimup
58. T J & M B Waugh	Manjimup	Manjimup
59. N G & B L Thompson	Manjimup	Manjimup
60. MC & NF Kilrain	Manjimup	Manjimup
61. Mottram & Son	Manjimup	Manjimup
62. de Russett	Manjimup	Manjimup
63. Bunnings	Pemberton	Pemberton
64. Bunnings	Northcliffe	Pemberton
65. S W Timber Supplies (Ditri)	Pemberton	Pemberton
66. J & K Sawmills (Wren)	Northcliffe	Pemberton
67. Midway Sawmills (Rudd)	Northcliffe	Pemberton
68. Bunnings	Walpole	Walpole
69. Denbarker Sawmill (Dolzedelli)	Denbarker	Walpole
70. Panelli Sawmills	Rocky Gully	Walpole
71. Kaleema Sawmills (Hollingsworth)	Rocky Gully	Walpole
72. Franey and Thompson	Albany	Albany
73. AGK Quality Woodware (Hunter)	Narrogin	Narrogin
74. Dryandra Timber Products	Narrogin	Narrogin
75. Wake and Beachem	Narrogin	Narrogin
76. C. Russell	Narrogin	Narrogin

(b) **Hardwood** (Portable - operate on bush landings)

Company	CALM District resp. for mill land inspection
1. Deadwood Sawmilling (Collings)	Mundaring
2. B. Clarke	Mundaring
3. R & L Potter	Harvey
4. B. Fearn	Collie
5. S & K O'Brien	Walpole
6. Mobility Milling	Walpole
7. K. Espinos	Busselton
8. Capel Timber Sawmill (Bax)	Busselton

(c) **Softwood** (not included in above)

Company		Location of Mill	CALM District resp. for mill land inspection
1.	Bunnings	Mundijong	
2.	Pinetec	Osborne Park	
3.	Koppers	Picton	
4.	Western Case & Joinery Works	Osborne Park	
5.	Wesfi	Dardanup	
6.	Wespine Industries	Dardanup	
7.	Timber Treaters	Bridgetown	
8.	Pempine	Pemberton	
9.	Wesfi	Kewdale	
10.	IPE Packaging	Busselton	

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.8 USE OF LOGS FOR BUSH OR MILL LANDING CONSTRUCTION

1. A FOIC may approve the sale of logs to a sawmiller operating under a Contract of Sale for use in the construction of mill landings. The FOIC may also approve the removal of logs by a CALM logging contractor for use in the construction of bush landings.

2. Logs used in bush landing construction must be less than second grade sawlog in quality. The Department does not charge royalty for such logs. Whenever possible, logs used in bush landing construction should, upon completion of logging, be sold as firewood, charcoal logs, or other low grade industrial wood products.

3. Logs used in mill landing construction must be recorded on a Delivery Note in the normal fashion. The product type recorded must be the actual sawlog grade of the logs (ie., first grade, second grade or third grade) and normal log prices will be charged.

   The same rules apply to logs destined for mill construction.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.9 LOG QUALITY ADJUDICATION

1. Although CALM's logging contractors are required, under the terms of their contracts, to carry out all initial preparation, grading and segregation of logs into the various log products, the Forest Officers in Charge are ultimately responsible for all log quality standards. The relevant FOIC and all Forest Officers under his/her control must take all reasonable steps to ensure that all logs carted from logging operations under his/her control meet the relevant specification, consistent with the need for full utilisation.

2. Log products that do not meet the relevant product specification may be rejected ("condemned" or "written off") by a Forest Officer before delivery, that is at the stump or at the bush landing. In these cases one end of the rejected logs should be marked with a cross in yellow lumber crayon. This "crossing out" also implies that the log in question is unsuitable for preparation into any alternative log product being supplied from that particular logging operation. Logs downgraded to a lower grade specification should have the recommended grade marked on the log in yellow crayon and be initialled by the Forest Officer.

3. Forest Officers must also be prepared to mark, again with yellow lumber crayon, one end of any acceptable log that is at the low end of the relevant quality range. This practice is particularly important when a contractor is having difficulty in interpreting a log product specification, or when a new log product is introduced to an operation. A Forest Officer must also be prepared to mark any log at a bush landing about which a contractor has doubts as to its acceptability.

   When marking logs, the Forest Officer should indicate the log product type, along with his/her initials and the date. When the log product type in question is obvious, the word "OK" may be substituted for the actual log product type.

4. Once logs have been carted by a CALM contractor to a customer's landing, and unloaded, the customer may request CALM to downgrade or reject any or all of the logs if the customer believes the logs are below specification. The conditions for acceptance by CALM of a request by a customer to downgrade or reject logs are:

   i) CALM is responsible for setting and applying the log specification prior to delivery (ie; the logs were not selected in the first place by the buyer as applies to marri sawlogs and jarrah or karri third grade sawlogs for example).

   ii) The source of the logs is clearly identifiable (ie; the logs, including logs measured by weight, are marked with the D/Note number and a coupe name and number).

   iii) The request is made as soon after the date of delivery of the logs as possible, so that deterioration of the logs between the date of delivery and the date of adjudication is minimised. During the "summer" or "dry soil" logging season (November to May inclusive) the request must be made within two weeks of delivery; between June and October inclusive the request must be made within four weeks of delivery, and

   iv) The logs have been correctly measured and recorded on a CALM log delivery note.

5. If a customer wishes to reject a whole or part truckload of logs before unloading, he may do so, however he runs the risk of being charged by CALM for all costs involved in any logs which prove to be within specification at subsequent adjudication.

6. Adjudication of all logs challenged by a customer under 4. above, or rejected by a customer as in 5., is carried out by the Executive Director of CALM, through specifically nominated CALM Forest Officers. These authorised Forest Officers currently are:

- For all hardwood customers within the Swan Region and Wheatbelt Region - Greg Lange.
- For hardwood customers in the Central Forest Region - Frank Vince and Bryan Doust.
- For Softwood customers in the Central Forest Region - Ian Scott.
- For all customers in the Southern Forest Region - Wayne Keals and Mark Read.
- For all customers in the South Coast Region - Wayne Keals.

NOTE: Some of the responsibilities for adjudication may be delegated to suitably qualified District staff, if approved by the Executive Director via Manager Timber Supply Branch.

7. The above authorised Forest Officers, when carrying out routine inspection of logs at customers' landings, will not normally be accompanied by logging contractor representatives. However, if more than approximately five cubic metres (or tonnes) of logs are likely to be officially downgraded or rejected, then the inspecting officer should arrange to have a representative of the relevant logging contractor in attendance. The reasons for the downgrading or rejection of the logs can then be immediately discussed with the contractor.

8. It is acceptable to have parts of logs downgraded or rejected at a customer's landing. It is also acceptable for a log to receive some treatment such as docking or delimbing in order to bring it up to specification.

In each case the task of cutting a log should be carried out by a representative of the contractor who is accompanying the authorised Forest Officer. For practical purposes however, especially if only a small number of logs or a small amount of cutting is required, the work may be carried out by the customer or the authorised Forest Officer.

If a lot of log treatment work is necessary, the authorised Forest Officer may adjudicate that all logs in a parcel be returned to the bush landing for treatment by the contractor and redelivery.

9. All decisions on logs challenged by a customer must be indicated on the logs by the authorised Forest Officer using orange tree marking paint. Rejected logs or part logs should be clearly marked with an "R". Logs inspected by the authorised Forest Officer and found to be acceptable should be clearly marked with an "OK".

10. It is CALM's responsibility, through the relevant contractor, to remove all rejected material from a customer's landing to either the operation from which the logs originated, or to another customer as directed by CALM.

11. Credit Notes issued for rejected logs are processed through CALM's Logging Operations Information System in the same way as Delivery Notes. It is the responsibility of the authorised Forest Officer conducting the adjudication to ensure that Credit Notes are distributed and processed accurately and promptly.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.10 SEIZURE OF FOREST PRODUCE

1. A Forest Officer who believes forest produce has illegally been removed may seize that forest produce whilst on any public road or within any State forest or Timber Reserve.

   Forest produce on private property but suspected of being the property of the Crown may be seized under warrant. A Forest Officer authorised by the Regional Manager may lodge a complaint to a Justice of the Peace who can in turn issue a warrant to enter and search for such produce. Only a Police Officer can seize forest produce on private property suspected of being the property of the Crown.

2. **Sequence**

   2.1 When a person is found to be in possession of forest produce in State forest, Timber Reserve or on a public road (having been stopped by a Forest Officer) and is either unwilling or unable to satisfy the Forest or CALM Officer of the manner in which he came to possess the forest produce, has committed an offence. If required to do so the person must show the Forest Officer the forest produce cut or obtained.

   2.2 Forest produce seized by a Forest Officer must be clearly stamped or marked with:

   * A broad arrow
   * The word "seized" and the Officers name and date
   * A "Notice of Seizure" label (CLM 143)

   The broad arrow and "seized" wording, name and date are to be marked on the seized forest produce with yellow timber crayon, but if crayon is not available then the seized produce may be marked with any available marking material. Where the forest produce seized is a whole or part of a stack then the produce seized needs to be clearly identified.

   The offender should be asked to sign a receipt for the seized produce.

   2.3 Conduct the interview using standard procedures (see below) and compile a breach report using the standard report format, CLM 259 (see Attachment 7.10.2).

   2.4 Once forest produce is seized it is necessary to allow the vehicle and driver to unload the seized produce and move off as soon as possible. In the case of logs this will best be done at the mill landing. With firewood and other easily removable produce it is best to encourage the driver to unload at a secure location, eg: District headquarters. The driver does not have to deliver the produce to a nominated location but an attempt to get cooperation for them to do so should be made.

   2.5 Once forest produce is seized it is an offence for any person without written authority of a Forest Officer to cut, injure, destroy, remove or interfere with seized produce. **NOTE:** The vehicle and cutting implements must **not** be seized, **only** the forest produce.

2.6 If a driver of a vehicle carrying forest produce will not stop when instructed to do so (by sign or action) the Forest Officer should note the:

- date
- time
- location
- type of load
- vehicle type and registration
- description of driver if possible.

A full report should be compiled as to the circumstances and reasons of why it was necessary to stop the vehicle. The name and address of the vehicle owner (and driver at the time) should be sought from local records, the Police or owner and included in the report.

2.7 Any person who aids, abets, counsels or procures or is directly or indirectly concerned in the commission of the illegal removal of forest produce is deemed to have committed the offence and should be interviewed independantly of the others considered to have committed the offence.

3. **Procedure for recording interviews and taking Statements:**

3.1 All statements from persons likely to be charged should be taken in duplicate, and in triplicate if the offender wants a copy.

The statement must be in the actual words of the offender. Each copy must be signed in ink by the offender, and any corroborating witness, the original copy to be held by the officer taking the statement for court evidence, if required.

3.2 A person present as a corroborating witness should be present the whole of the time the statement is being taken.

3.3 When taking a statement, the obligation resting upon the Forest Officer is to put all questions fairly and to refrain from anything in the nature of a threat, or any attempt to extort a statement ie, no threats, violence, bribes or promises are to be used to obtain a statement.

3.4 Points to be included in the statement are:

i) Exact Location (6 Fig ref.) and time of apprehension.
ii) Registration, make, type and colour of vehicle.
iii) Name and address of offender.
iv) What section, or sections of Calm Act, Wildlife Conservation Act, Bush Fires Act infringed.
v) Did offender know that he had infringed any of the above acts? Was there any evidence to tell offender that he had illegally entered Quarantine area - ie, were there any "No Entry" signs on the roads upon which he travelled?
vi) Particulars of how and why infringement occurred.
vii) Names and addresses of all persons present (including Forest Officers).

3.5 The written statement should commence as follows:

"I have been warned by (Officer's name and rank) that I am not obliged to make a statement (or say anything) unless I wish to do so, and whatever I do say will be taken down in writing and may be given in evidence."

The statement should end as follows: (in the offenders own handwriting if possible).

"I have read this statement through, and it is true and correct in detail and given at my own free will without any threat, promise or inducement, and I do not desire to make any corrections."

3.6 The person making the statement should read it aloud prior to signing the statement.

3.7 Mistakes should be crossed out, and should be initialled by the person making the statement.

3.8 Attachment 7.10.1 provides guidelines to Officers required to interview offenders who may not be able to properly read or write.

3.9 Attachment 7.10.3 is a proforma for use when taking a statement.

4. Standard Action to be taken when Delivery Note Discrepancies are found:

4.1 Forest officers are required to check a minimum of 5% of all D/Notes in the field. Possible discrepancies, and recommended action to be taken, are listed in the table below:

Delivery Note Discrepancy V Recommended Action

Discrepancy	Action Category (See codes below)
1. No Delivery Note	A
2. Suspicion of attempt to defraud	A
3. Suspicion produce illegally obtained	A
4. No date or incorrect date	A
5. No customer name	B
6. No customer address	B
7. No coupe name or number	B
8. No species name, or wrong species name	B
9. No product type, or wrong product type	B
10. No total number of logs, or incorrect numbers (if individual log measurement)	B or C
11. No name(s) of logging contractor(s)	C
12. No work description, or incorrect work description	D
13. No indication whether CALM contractor or not	D
14. No carter's signature	D
15. No truck number (if required by contractor)	E
16. No faller's brand (if required by contractor)	E

Action Category	Description
A	Seizure with full detailed breach report
B	Investigation by District with statement for Forest offence to Region/SOHQ. Notify employer. CLM 259 to be completed
C	Investigation by Forest officer and caution to offender with recording at District and notification to employer. CLM 259 to be completed
D	Caution by Forest officer only and file note
E	No action

4.2 When inspection of a D/Note on a truck results in decision to seize the load of logs, the following steps should be taken:

* the truck driver be instructed to move his truck to a safe place off the road edge,

* the Forest officer contact the driver's employer or the contractor representative,

* complete a CLM 259,

* organize the truck to be unloaded at an appropriate place,

* place logs under seizure and release the truck,

* notify SOHQ on same day (Manager Timber Production Branch).

4.3 Stopping of trucks on main roads and highways should be avoided unless the truck can be directed to an area off the road survey where other road users are not in any way put at risk.

4.4 If the Forest Officer believes an offence has been committed, he should communicate ahead to the expected truck destination, or follow the truck and carry out the investigation at the truck destination.

5. Standard Action to be taken when various quantities of minor forest products are suspected to be illegally obtained:

* Domestic firewood between 0.5 and 1 tonne - CLM 259

* Domestic firewood between 1 and 2 tonnes - seizure and CLM 259

* Domestic firewood over 2 tonnes - seizure and full breach report

* Fencing material up to 10 tonnes - seizure and CLM 259

* Fencing material over 10 tonnes - seizure and full breach report

* Burls, any quantity - seizure and full breach report

* Speciality timber cut in the bush - seizure and full breach report

* Other forest produce, up to 1 tonne - seizure and CLM 259

* Other forest produce, over 1 tonne - seizure and full breach report

GUIDELINES FOR INTERVIEWING OFFENDERS AGAINST CALM ACT AND REGULATIONS

1. When English is First Language

1.1 Over 18 years of age:

1.1.1 Can read - offender to read interview notes and sign;

1.1.2 Cannot read - get independent third party to be present during interview and to read interview note to the offender.

1.2 Under 18 years of age:

Parent or guardian to be present at interview.

2. When English is not First Language:

2.1 Over 18 years of age:

2.1.1 Does not understand English - obtain an independent interpreter to assist with the interview, and to read the interview notes to the offender.

2.1.2 Does understand English, but cannot read - get independent third party to be present during interview and to read interview notes to the offender.

2.1.3 Can read English - offender to read interview notes and sign.

2.2 Under 18 years of age:

- As above, but parent or guardian to be present at interview as well.

NOTE: [a] For tribal aboriginals, have a JP or friend at the interview.

[b] There must be no threat or inducement offered. This includes a perception of threat or inducement.

[c] During a lengthy interview, offer a drink (non alcoholic) cigarette or rest break.

[d] Don't interview a person who is sick, very tired or affected by alcohol

Attachment 7.10.2

Form CLM 259 (1992)

REPORT CONCERNING ILLEGAL CUTTING OR REMOVAL OF TIMBER OR OTHER FOREST PRODUCE

FULL NAME OF OFFENDERS: _____

Address of Offender: _____

Nature of Offence _____

CALM Act breached (Section): _____

Forest Regulations breached (Section): _____

Date and Time of detection: _____

By whom Reported or Detected: _____

Names and addresses of any

other persons present: _____

_____

_____

Locality (Attach plan or sketch): _____

Period of Operations: _____

What indications are there of operations: _____

Vehicle used, Registration Number,Owner: _____

If timber industry employee, employed by whom: _____

Quantity of timber or forest produce removed: _____

To whom supplied: _____ Quantity seized: _____

Purpose for which obtained: _____

Was trespass deliberate or accidental _____

(State reasons for opinion):

_____

Was area fenced or blazed or signposted (give particulars): _____

Could direction of removal be seen

(Give particulars): _____

Has offender been previously reported or warned: _____

Is offender a registered timber worker: YES/NO

Further particulars: _____

_____

Recommendation: _____

Statements obtained and attached hereto: _____

Seized firewood is located at: _____

Date: _____

Forest Officer/CALM Officer: _____

District Manager's Endorsement: _____

District Manager's Signature: _____

Regional Manager's Recommendation: _____

Regional Manager's Signature: _____

RELEASE FROM SEIZURE:

Date produce released from seizure: _____

Action to be taken with the forest produce: _____

Manager Timber Supply to sign: _____

STATEMENT BY PERSONS APPREHENDED BY AN AUTHORISED CALM OFFICER

Please to be advised that I: .....

Address: .....

.....

Occupation: .....

Was apprehended by .....

on.....day of .....19....

at.....time .....

and was requested to make a statement.

I have been advised that I do not have to make a statement, but should I do, then anything I say will be taken down in writing and may be used as evidence.

I wish to make a statement signed:

I have read this statement through and it is true and correct in detail and given at my own free will, without any threat, promise or inducement, and I do not desire to make any corrections.

Signed .....

Witnessed by.....

In the company of .....

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.11 RESPONSIBILITIES OF FOREST OFFICERS

1. A Forest Officer is an officer of the Department of Conservation and Land Management, designated as such by the Executive Director. A Forest Officer, upon designation, will be issued with a Certificate of Authority, signed by the Executive Director. This certificate gives the Forest Officer all the responsibilities invested in a Forest Officer as specified in the CALM Act. The CALM Act also requires that the area of the State in which the Forest Officer is authorised to operate be listed on the Certificate.

2. To be designated as a Forest Officer, it is likely that a new graduate will be required to complete about two years of on-the-job training.

3. To carry out his or her responsibilities, a Forest Officer must not only possess adequate knowledge and bush skills, but must possess sound people management skills.

   A paper written by R J Underwood in 1979 entitled "The Application of Management Principles to Management of Hardwood Logging Operations in the Field" is a valuable document in relation to this subject.

4. To be designated a Forest Officer in Charge (FOIC) or a Forest Representative, as defined in the logging Contracts to Supply, Forest Officers must meet the requirements of formal Timber Supply training schools, and be formally nominated by the relevent Regional Manager (in the case of a FOIC) or by the District Manager (in the case of a Forest Representative).

   Attachment 7.11.1 details the roles and responsibilities of the FOIC, the Forest Representative, and other key personnel involved in timber Supply.

ROLES AND RESPONSIBILITIES OF KEY PERSONNEL INVOLVED IN TIMBER PRODUCTION

1. **Definition of FOIC**

In both the Contracts to Supply and the Contracts of Sale, the FOIC is defined as the "forest officer for the time being or from time to time appointed in writing by the Executive Director to be in charge of any site or any part thereof".

2. **Role of FOIC**

In the Contracts to Supply the role of the FOIC is covered under clause 25, which states that "All work shall be executed in accordance with Contract and subject thereto, to the satisfaction of and (if applicable) in accordance with any directions given by the FOIC. All orders, instructions, directions, determinations, certificates and approvals which may or are to be given to the contractor by a FOIC pursuant to the Contract shall unless the Contract provides otherwise, be deemed to be given by that FOIC on behalf of the Executive Director".

The FOIC's are therefore the persons who are officially in charge of CALM's logging contractors. They are therefore the persons who are responsible for:

- Advising the contractor of his work areas and production targets
- Ensuring products produced by the contractor meet specification
- Ensuring all work carried out is in accordance with the Code of Logging Practice, the Manual of Logging Specifications and/or the Pine Management Guide.

and

- Ensuring the contractor is paid correctly and promptly at the end of each half monthly accounting period.

3. **The Forest Representative**

In the Contracts to Supply the Forest Representative is defined as a "Forest Officer to be named by the Executive Director or a FOIC (to which is delegated) such of the powers, duties, discretions and authorities vested in (the FOIC) as he may think fit".

The FOIC may therefore delegate some or all of the tasks listed under 3 to the Forest Representative. However, the FOIC must maintain his/her ability to carry out the tasks delegated because he/she is the one who must get involved if a conflict arises between the Forest Representative and the Contractor.

4. **Knowledge/Skills**

To be able to carry out the above duties the FOIC or Forest Representative must have the knowledge and/or skills to be able to actually do the following, or at least be able to check to ensure the following is done by another Forest Officer :

- Set delivery schedules to the various customers which must be supplied by the contractor in question (in liaison with Regional procurement officers/Timber Supply Branch officers)
- Complete Logging Operations Prescription (CLM709) form using the LOIS System Codes and CLM216 forms

- Complete Pre-Operation Checklist (CLM109)
- Apply in the field the appropriate silvicultural/treemarking prescription
- Select log products in accordance with set specifications
- Apply the hardwood "In-forest Treatment" prescription
- Complete a Seven-way Test (CLM781) and apply in the field the dieback hygiene rules as per the Seven-way Test and the Operational Instructions for Dieback and Logging.
- Carry out a general logging inspection and complete a Softwood or Hardwood Logging Inspection and Action Sheet (CLM106 or CLM 105)
- Carry out logging inspections in order to formally certify hardwood logging areas as complete, and complete a Certification Sheet (CLM104)
- Carry out a field assessment of soil damage, and complete a form CLM108
- Carry out a field assessment of crop tree damage and complete a form CLM107
- Carry out field checks of Delivery Notes
- Code Delivery Notes and enter into LOIS
- Use LOIS to monitor mill intakes, contractor production levels, production by operation, and use of Delivery Notes
- Efficiently administer any breaches of rules by the Contractor
- Pay Contractors promptly via the Contractor's Payment Report in LOIS
- Accurately record cut over areas and silvicultural treatment details on HOCS and POCS sheets and complete Coupe Silviculture Reports (CLM160) for jarrah operations.
- Carry out post operation checks and complete checklists (CLM 813)

and

- Maintain regular contact with the Contractor and his representatives, and ensure the names of the contractor's representatives are nominated to the FOIC in writing; and that the names of the FOIC and Forest Representative are nominated in writing to the Contractor.

All the above tasks need to be done correctly and promptly. If several CALM logging contractors are working in a CALM District, the FOIC's job can be difficult and time consuming. This is where the Forest Representative plays a role.

5. Nomination of FOIC's and Forest Representatives

The nomination of FOIC's is a responsibility of Regional Managers who control the works programs and priorities of staff within their Regions.

Timber Supply Branch staff, with their knowledge of contractors, and with their involvement in Timber Supply training schools, can advise Regional Managers on nomination of FOIC's.

6. Role of the Region

Regional staff (ie, Regional Manager, Regional Procurement Officers and Regionally based Planning and Inventory Officers) are not responsible for supervising or instructing CALM logging contractors directly in the field (unless of course, a Regional Officer is a nominated FOIC).

The specific responsibilities of Regional staff in relation to Timber Supply are :

- Approve Seven-Way Tests
- Prepare logging and roading plans (after liaison with Districts)
- Co-ordinate delivery schedules to the various customers, especially for customers who are supplied by contractors from more than one District or Region (in liaison with District and Timber Supply Branch officers). These schedules should be for a 12 monthly period
- Approve Logging Operation Prescriptions (CLM709) and enter into LOIS
- Use LOIS to monitor mill intakes and contractor performances
- Carry out general logging inspections and complete Softwood or Hardwood Logging Inspection and Action Sheets (CLM106 or CLM105)
- Provide one-to-one advice and guidance to District staff involved in timber supply on any aspect of timber supply, but particularly the selection of log products and the supervision of contractors in the field.
- Check log quality at customers landings and, if necessary, approve the write-off or redirection of below-specifiction logs using CLM076
- Maintain standards within the Region, and between Regions by visiting other Regions as required
- Act as link between FOIC & TSB for resolution of contract problems and issues

and

- Provide specific advice to a FOIC if the FOIC is confronted by a difficult problem that he/she cannot solve.

7. Role of Timber Supply Branch

As with the Regional staff, Timber Supply Branch staff are not responsible for supervising or instructing CALM logging contractors directly in the field.

Timber Supply Branch's role is centred around the negotiations and contractual arrangements that go with the setting up of Contracts to Supply and Contracts of Sale in the first place.

Specifically, Timber Supply Branch is responsible for :

- Calling tenders or conducting auctions for the production or sale of log products
- Authorising new contractors and customers

- The development and maintenance of LOIS
- Preparation of Contracts of Sale and Contracts to Supply
- Setting log specifications
- Preparing expenditure and revenue estimates for timber production
- Writing, producing and maintaining the "Code of Logging Practice" and the Manual of Logging Specifications
- Providing formal training in timber supply for District and Regional staff
- Providing specific advice to Regions and FOIC's on matters that cannot be solved locally (this usually involves talking to customers and contractors as well as CALM staff)

and

- Invoicing customers through LOIS and Accounts Branch.

8. **Communication Links Between CALM and CALM Employed Logging Contractors**

The table on next page is a guide illustrating the correct lines of communication between the different personnel involved in timber supply.

COMMUNICATION BETWEEN CALM & LOGGING CONTRACTOR

Level	Contractor Personnel	Functions	CALM Personnel
1.	Company Manager	. Contract term & conditions . Code of Logging Practice . Manual of Specs (ie policy matters)	Executive Director (through Forest Resources Division) & T.S.B.
			Region
			Specialist Branches
2.	Logging Supervisor	. Logging plans . Production targets . Product quality . Compliance with Code & Manuals . D/Note processing & payments	F.O.I.C.
3.	Bush Foreman	. Day to day logging ops (demarcation of coupes fallers blocks, certification of completed blocks, product segregation, environmental assessments) . Compliance with Code & Manuals	Forest Representative
		. Treemarking & some of functions of Forest Representative	Forest Officer

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