6 Log Specification info

MANUAL OF HARDWOOD LOGGING SPECIFICATIONS

For control of Hardwood Logging Operations in the Northern, Central and Southern Forest Regions

1 November 1987

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
50 HAYMAN ROAD
COMO WA 6152

INTRODUCTION

This manual has been produced by the Timber Production Branch of the Conservation and Land Management Department. Any queries should be referred to the Manager, Timber Production Branch or the Regional Manager of the appropriate Forest Region.

This manual complements the "Code of Hardwood Logging Practise". It contains all detailed specifications necessary for the control of all hardwood logging operations conducted in State Forest, or other Crown land under C.A.L.M. control, in the three Forest Regions.

The individual specifications contained in this manual will be updated annually, or more often if necessary, by arrangement between the Regional Managers of the three Forest Regions. Industry representatives will be consulted as required during such updates.

Technical forestry terms used in this manual are as defined in the booklet "Forestry Terminology in Western Australia", Technical Paper No. 1 by F.H. McKinnell, 1982.

A copy of this manual should be available to every C.A.L.M. officer involved in hardwood logging operations in the three Forest Regions. Copies should also be provided for relevant Industry personnel, including bush bosses if considered necessary.

Any suggestions for improvement should be forwarded in writing to Timber Production Branch, S.O.H.Q.

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C O N T E N T S

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SECTION 1 - PLANNING

SPECIFICATION 1.1 LOGGING PLANS

1. Regional Inventory Sections are responsible for the preparation of rolling, five year (or four year) logging plans for all licensed sawmills. Updating of these plans must be completed not later than one month prior to the start of the licence year. The plans will be prepared after due consultation with District staff and Timber Industry representatives. The plans must be approved by the relevant Regional Manager.

2. The Five (or Four) Year Logging Plan shall tabulate, for each licensed sawmill, or operative Contract of Sale, the following information:-

   i) year of cutting;
   ii) forest block;
   iii) compartment;
   iv) cutting prescription
   v) area;
   vi) estimated volume by species.

   The cutting compartments will be illustrated on 1:50,000 scale forest block plans. Attachment 1.1.1 is an example of a page from a Five Year Logging Plan.

3. Plans covering the first year, or first two years, of the five (or four) year plan (Annual, or Two year, Logging Plan) shall, when applicable, include the following individual plans:-

i) Logging plan - highlighting the following information -
   (a) moist soil (dieback) logging areas;
   (b) moist soil (low potential risk) logging areas
   (c) moist soil (secure dieback-free) logging areas
   (d) dry soil logging areas
   (e) stream, amenity and road reserves
   (f) location of existing moist and dry soil roads
   (g) coupe boundaries and numbers
   (h) research plots (no logging areas)
   (i) areas previously cut over

ii) Hygiene Plan - highlighting the following information -
   (a) secure dieback-free areas
   (b) dieback areas
   (c) low potential risk areas
   (d) high potential risk areas
   (e) not-effectively quarantined areas
   (f) uninterpretable areas

iii) Impact Plan - highlighting the following information -
   (a) low impact areas
   (b) moderate impact areas
   (c) high impact areas

iv) Landform/Site Vegetation Plan - highlighting the following information -
   (a) landforms as per the System 6 study
   (b) vegetation site types as assessed by field assessment

v) Management Level Inventory Plan - highlighting the following information -
   (a) total sawlog volume in the cutting section
   (b) stocking of SEC quality poles.

4. "Units of cutting" in logging plans must conform to the following heirarchy:-

i) Region - specific name allocated by SOHQ
ii) District - 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 allocated
vi) Subcoupe or fallers block - specific name or number allocated by District

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Attachment 1.1.1

5 YEAR SAWLOG PLAN 1986/87 - 1990/91

SAWMILL: MILLARS - YARLOOP FP(S)L 1648

PERMISSIBLE INTAKE: 50,000m (46,000m^3 after December 1986)

Year	Forest Block	Compt	Presc	Area (ha)	m^3 Jarrah	m^3 Marri	Comments
1986-87	ROSS	2	CUT J	651	26,700		(6,000m^3 allowed for Collie in compt 2)
	EDWARD	1	CUT J	678	20,400		
					47,100		
1987-88	ROSS	1	CUT J	625	17,500		
	ROSS	4	CUT J	210	5,400		
	EDWARD	2	CUT J	737	22,100		
					45,000		
1988-89	ROSS	4	CUT J	630	18,900		
	ROSS	5	CUT J	820	24,600		
	BELL	1	CUT J	320	4,800		
					48,300		
1989-90	ROSS	4	CUT J	240	2,900		Consider change in cutting from ROSS 6 to CHALK 7
	ROSS	6	CUT J	280	5,000		
	CHALK	2	CUT J	670	12,000		
	CHALK	3	CUT J	1270	22,800		
	BELL	1	CUT J	157	4,700		
					47,400		
1990-91	ROSS	6	CUT J	1100	27,500		
	CHALK	1	CUT J	525	16,300		
	BELL	1	CUT J	157	4,700		
					48,500		

SPECIFICATION 1.2 SEVEN WAY TESTS

1. The document "Dieback Policy 1982" requires that, before the commencement of any operation in jarrah forest that has the potential to introduce or spread Phytophthora cinnamomi, the risk is 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 "Dieback Review 1982" (1983). The Seven Way Test evaluates the following seven factors of a proposed operation in jarrah forest:-

   * type of operation
   * degree of hygiene
   * risk of introducing P. cinnamomi
   * forest type
   * likely impact
   * land use
   * consequences of impact on land use.

3. Seven Way Tests must be prepared for any proposed roadworks or logging operation in jarrah forest. 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 area covered by an individual Seven Way Test should correspond to a discreet roading and/or logging operation. 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 CLM 781 and must include accompanying plans at scale 1:50,000 or larger. Attachment 1.2.1 is an example of a completed Seven Way Test on form CLM 781 (excluding the maps that would accompany this test).

6. The levels of authority required to approve Seven Way Tests on different areas of forest are detailed in Attachment 1.2.2.

7. Attachment 1.2.3 is a guide to assist in assessing the level of consequences in a Seven Way Test.

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DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
DIEBACK POLICY - 1982

Attachment 1.2.1

CLM 781
2nd EDITION

SEVEN-WAY TEST

DIVISION COLLIE

DATE 1/10/86

PURPOSE OF 7 WAY TEST IS TO WORK OUT THE IMPACT & CONSEQUENCES ON THE PRIMARY LAND USE. ATTACH - i) D/B HYGIENE MAP, ii) SITE IMPACT MAP, iii) ACCESS PLAN, iv) MOIST & DRY SOIL AREAS

THE WORK PROPOSED

PURPOSE Integrated hardwood logging operation for sawlogs, bridge timbers and poles.

INITIATED BY District Manager, Collie

LOCATION (block etc) Arcadia Block, Compartment 2

TYPE AND EXTENT OF THE WORK Wide ranging, intensive operation which includes (a) access for planning,
(b) construction and upgrading of logging roads,
(c) treemaking, felling and snigging to landings of all products at the same time,
(d) loading and hauling to sawmill,
in accordance with dieback logging policy N°3, dieback policy '82 and Manual of Specifications (N.J.F.)

ARE OTHER OPTIONS AVAILABLE? Specify, including "do nothing"
1. Log areas outside DRA, using poor quality dieback and snigget maps.
2. Stockpile to make up deficit of wood not available under moist soil conditions.
3. Make less than permissable intake available — possible mill closure.

HYGIENE MEASURES REQUIRED

Summary of hygiene prescription

CLEAN MACHINERY (YES)/~~NO~~
1. All vehicles and machinery accessing forest that is free of dieback infection.
2. Snigging equipment, operating in dieback-free forest, entering logging micro-catchment from landing or adjacent micro-catchment
3. Loading equipment (moving soil) crossing dieback risk category boundary (except into dieback)

DRY SOIL YES:— road construction and maintenance; logging of nominated dry soil cutting areas
NO:— minor road maintenance, logging of nominated moist soil cutting areas.

SUPERVISION CALM: FOIC and Forest Officers
INDUSTRY: Burning supervisor and Bush boss.

ACCESS ROUTES In DRA — Stella Road and other approved roads located low in the profile. Shunts in forest not infected with dieback may be used in dry soil conditions (see plan N°3)
Outside DRA — Mungalup Road

continued overleaf

HYGIENE MEASURES continued

DIEBACK HYGIENE PLANS - specify type
Dieback maps based on 70mm photography (flown & interpreted in 1985)
Predicted impact maps based on site vegetation mapping.

DIEBACK CATEGORIES As per hygiene risk maps.

ANY OTHER e.g. split-phase operations, mini-catchments etc.
1. Operations in dieback-free forest to use split phase landing management.
2. Roads located low in profile, as much as practically possible.
3. Washdown of all vehicles, at designated washdown points, when logging roads place a significant area of dieback-free forest at risk.

3 RISK OF DIEBACK FUNGUS (high, moderate, low)

RISK OF INTRODUCTION V.low to low

MULTIPLE INTRODUCTION RISK V.low to low

RISK OF SURVIVAL Low to High

RISK OF SPREAD
Artificial V.low to low Natural Low to High

RISK OF MULTIPLE SPREAD
Artificial V.Low to Low Natural Low to High

COMMENTS Risks of introduction and spread kept V.low to low by machinery not being permitted to move soil under moist soil conditions.

4 LANDFORM AND VEGETATION

Describe according to types used in impact category tables

Logging area is 771 hectares

* Vegetation site types S-tS : 95% of logging area.
O, U, Ut, eT : 5% " " ".

* Refers to areas not infected with dieback (521 ha)

5 LIKELY IMPACT ON VEGETATION Refer to tables of impact

SITE TYPE		OVERSTOREY	UNDERSTOREY
S-tS	(a)	low - moderate	low - moderate
	(b)	moderate - high	moderate - high
O, U, Ut, eT		low - moderate	low - moderate

Areas (a) & (b) separated by Interpreters in field.

WILL INTRODUCTION OF DISEASE AND IMPACT BE MONITORED? YES

HOW? 1. Regular selective sampling during and after logging.
2. Follow-ups 230 mm photography 5 years after logging.

BY WHOM? District and Interpretation staff.

6 LAND USE

GWP No. 87 Catchment Protection and Hardwood Timber Production.

WITHIN DISEASE RISK AREA? (YES)/~~NO~~ A3.1
Classify A_1 A_2 etc or other (see Policy No. 10)

WITHIN ACTIVE CATCHMENT? (YES)/~~NO~~
CATCHMENT NAME Wellington

SALINITY ZONE specify using map in GWP 87 LOW
(Uncut stream buffers to be 50m wide. BAOD will be, on average, greater than 12 m^2/ha outside buffers)

7 CONSEQUENCES ON LAND USE Refer to tables of consequences

IF HYGIENE SUCCESSFUL Nil

IF HYGIENE FAILS Areas put at risk will be confined to microcatchments in first instances. Multiple failures will result in larger areas put at risk. The land use values most seriously affected will be hardwood timber production.

see over

CONSEQUENCES continued

CONSEQUENCES ON BROADER SCALE on catchment, forest ecosystem, landscape

Level of consequence = f (risk)(impact)(landuse)
= (V.Low-Low)(Mod-High)(Mod-High)
= ACCEPTABLE for dry soil.
= (Low)(Low-Mod)(Mod-High)
= ACCEPTABLE for moist soil, no soil movement.

CONSEQUENCES OF NOT PROCEEDING WITH THE WORK on economy, employment etc

1. Logging operations will be directed to areas outside DRA, where the resource is scattered and lower quality. Higher costs to the Industry, and loss of forest values will result.
2. Higher levels of stockpiles will be required which will lead to higher costs to the Industry.
3. Failure by the mill to achieve stockpile levels in 2. will lead to mill closures, with resulting social and political disruptions.

8 EVALUATION OF 7-WAY TEST Your comments, signature and date

OIC AREA

Recommend this 7-Way Test be approved.

District Manager
1.10.86.

REGIONAL SUPERINTENDENT

Approved.

Regional Manager
2-10-86.

OIC PROTECTION

POLICY REVIEW GROUP

ACTING CONSERVATOR

7 WAY TESTS - AUTHORITY TO APPROVE

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 Environmental Protection and/or Environmental 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	Manager, Environmental Protection Branch (Recommendation by Regional Manager) See also Note below	Kept on same file as 2 above.

Note:

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 S.E.C. line maintenance project, 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 Policy Review Group.

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.

(extracted and updated from Circular 9/84)

SEVEN WAY TESTS

GUIDELINES FOR ASSESSMENT OF LEVEL OF CONSEQUENCES

Three factors need to be taken into account when making an assessment of levels of consequence for a Seven Way Test.
They are: 1. Risk of introduction/spread.
2. Impact.
3. Land use.

They can be expressed as a factorial equation,

i.e.: level of consequences = f (risk) (impact) (landuse)
(Acceptable/Unacceptable)

Assessment of Factors

1. Risk: rate as - very low, low, moderate, high.

   Very Low: dry soil, 230mm maps, hygiene
   Low: moist soil, 230mm maps, hygiene
   Moderate: moist soil, no 230mm maps, hygiene
   High: moist soil, no 230mm maps, no hygiene

2. Impact: rated as low, moderate, or high, on vegetation types or landforms.

   Low: few species susceptible, some individuals killed
   Moderate: most species susceptible, some individuals killed
   High: most species susceptible, most individuals killed
   (see Seven Way Test Guidelines - Impact)

3. Landuse: rated as low, moderate, high.

   Low: water production
   Moderate: timber production, recreation
   High: catchment protection

Examples of Acceptable Factorial Equations are:

Case 1: dry soil, all vegetation types, any land use.
L. of C. = (very low) (low-high) (low-high)

Case 2: moist soil, lower impacting vegetation, any land use.
L. of C. = (low) (low-moderate) (low-high)

NOTE: for moist soil operations in forest not infected with dieback, good maps and maximum hygiene are required.

Summary

Whenever a Seven Way Test is drawn up it is recommended that this method of assessment is attempted. A rough guideline is (i) when risks are rated as very low or low, levels of consequence are only acceptable if impact is rated as low or moderate, and (ii) when risks are rated as moderate or high, levels of consequence are only acceptable if impact is rated as low, eg. in Karri forest types.

SECTION 1 - PLANNING

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 company, need to enter a specific quarantine area, the local CALM District may issue a single quarantine entry permit to that logging company. A copy of this permit must be kept in every vehicle/machine, belonging to or associated with that logging company, 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.

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SECTION 1 - PLANNING

SPECIFICATION 1.4 COUPE CUTTING PRESCRIPTIONS AND PLANS

1. Preparation of coupe cutting prescriptions and plans is the responsibility of the District in charge of a logging operation. Industry personnel should be consulted as required during preparation of these plans. The prescriptions are prepared for use by all C.A.L.M. officers involved in the logging operation, and for all relevant Industry personnel including bush bosses. The coupe plans must be used to record the progress of cutting and extraction, by individual fallers blocks. The certification of completed logging areas relates directly to such coupe plans.

2. For each coupe or set of similar coupes, a Coupe Cutting Prescription must be prepared on the prescribed form CLM 093 (Attachment 1.4.1). This document requires the District to decide on silvicultural objectives and marking techniques and contains a checklist of work required before cutting starts.

3. A Coupe Plan or plans must accompany the Coupe Cutting Prescription. Coupe plans shoud be prepared on 1:25,000 scale, or larger, base maps, or they may be drawn freehand as "blow-ups" of a given area.

   Coupe Plans should show the following information:-

   * individually numbered coupes and sub-coupes
   * all access roads
   * all watercourses
   * all areas reserved from cutting
   * dieback hygiene boundaries
   * ridgelines

* location of landings
* individually numbered faller blocks
* major snig tracks
* any other information considered necessary

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HARDWOOD COUPE CUTTING PRESCRIPTION

A. DESCRIPTION

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

B. SILVICULTURE

1. Cutting History: .....
   .....
   .....
2. Forest Type/Structure: .....
   .....
   .....
3. Status of Regeneration: .....
   .....
   .....
4. Silviculture Objective: .....
   .....
   .....
5. Tree Marking Technique: .....
   .....
   .....

C. CHECKLIST FOR COUPE PREPARATION

	TASK	DATE COMPLETED
1.	Roading	.....
2.	Dieback Line Marking	.....
3.	Coupe Demarcation	.....
4.	Road, Stream & Amenity Reserve Demarcation	.....
5.	Sub-Coupe Demarcation	.....
6.	Treemarking	.....
7.	Preparation, and forwarding to Region, of CLM 709	.....

D. LOGGING ARRANGEMENTS

1. Licence or Contract to Supply No: .....
2. Logging Company: .....
3. Bush Boss: .....
4. Logging Method: .....
   .....
5. Stockpiling Arrangements: .....
   .....
   .....
6. Haul Routes: .....
   .....

7. Log Product Priorities:

Priority	Log Product	Destination
1.	.....	.....
2.	.....	.....
3.	.....	.....
4.	.....	.....
5.	.....	.....

E. OTHER

.....
.....
.....
.....
.....
.....

F. CALM STAFFING

1. Forest Officer in Charge .....
2. Other Staff

Name	Responsibility
1.	.....
2.	.....
3.	.....

Officer Compiling: .....

Date: .....

SECTION 2 - ROADING

SPECIFICATION 2.1 SELECTION OF LOG HAUL ROUTES

1. Conceptual plans of log haul routes must be obtained by Districts from (a) relevant Industry representatives or (b) contractors operating under Contracts to Supply, at least two years in advance of cutting. Using this information, and subject to Seven Way Tests, the precise alignment of proposed logging routes is determined and included in the Two Year (or One Year) Logging Plan.

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

   * use low profile roads
   * avoid stream reserves, 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 exact alignment of proposed new roads must be approved by the District Manager. In instances where proposed new roads intersect Shire or M.R.D. roads, Shire or M.R.D. engineers must be consulted.

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SECTION 2 - ROADING

SPECIFICATION 2.2 ROAD CONSTRUCTION

1. Road construction should take place in dry soil conditions only.

2. Specifications for new roads and upgrading of existing roads.

	Major Haul Rds		Other, Including In-Coupe, Rds	
	For dry soil use	For wet soil use	For dry soil use	For wet soil use
Clearing width	10m	10m	5m	5m
Road formation width	8m	8m	4m	4m
Gravel thickness	Nil or as Req.	min 15cm	Nil or as Req.	min 15cm
Culvert spacing	See (a) below	See (a) below	See (a) below	See (a) below
Culvert size	See (b) below	See (b) below	See (b) below	See (b) below
Table drain depth	20cm	20cm	10cm	20cm
Major stream crossings	See (c) below	See (c) below	To be avoided	To be avoided
Off-shoots	See (d) below	See (d) below	See (d) below	See (d) below
Maximum grade	7^{o}	5^{o}	10^{o}	8^{o}

(a) Culvert Spacing:

* Culvert spacing depends on the grade of the road and the amount of water which reaches the road from the hillside.
* A culvert must be installed at the bottom of every grade.
* The number of culverts required per km will generally vary from 2 to 12.

(b) Culvert size:

* The size of culvert required depends on the catchment area, the run-off conditions, and the maximum incidence of rainfall. The following table is a guide showing maximum watersheds for a range of pipe sizes:

Pipe Diameter	Maximum Catchment Size
30cm	36ha
37.5 cm	56ha
45cm	80ha
60cm	144ha
75cm	244ha
90cm	324ha

(c) Major Stream Crossing:

* Must be contracted with pipes or a bridge - full earth/log fills are not permitted.
* Approach must be as close to but not at right angles to contours, keeping in mind road alignment and safety.
* Borrow areas must be > 20m from watercourse.
* Water from borrow areas must be directed into silt trap or vegetative filter.
* Off-shoots must be constructed at regular intervals to turn water into silt traps of natural vegetation.
* Fill must be consolidated to minimise erosion of loose soil and risk of slumping.
* Embankments must be left rough surfaced or corrugated.
* 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 cleared on both sides of a stream crossing (In some specific instances this may have to be sealed.)

(d) Off-Shoots:

* Off-shoots must be sufficient in number to prevent table drain erosion.
* Off-shoots into dieback-free forest must be approved by the FOIC. These off-shoots should be at the lowest point in the topography.
* Off-shoots carrying water from dieback-infected forest must not discharge into dieback-free forest. If necessary the water must be carried in the table drains until it can be discharged into sumps or vegetation filters close to a watercourse.
* Off-shoots must have a flared 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.

3. The location and use of gravel pits must be approved by the FOIC. Gravel for use on roads in dieback-free forest must be obtained from uninfected gravel pits. Small stockpiles of suitable road surfacing material should be established at the time of construction for later use in areas likely to cause problems and for gravel road maintenance.

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

5. Road signposting must meet the requirements of the T.I.R. Act and conform to M.R.D. standards.

6. Road names must be approved by the Department's Nomenclature Committee. Road name signs must conform with the Department's Sign Manual.

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SECTION 2 - ROADING

SPECIFICATION 2.3 ROAD MAINTENANCE

1. The cost of road maintenance will be borne by the road user, as decided and directed by the Forest Officer in Charge.

2. Maintenance, using earth moving machinery, of roads located inside dieback-free forest must be restricted to dry soil conditions only. Maintenance of these roads by hand, for example cleaning culverts or filling potholes, may and should be done at any time as required. Only dieback-free gravel may be used.

3. Maintenance grading must aim to shape the road profile, and to clean table drains, to improve drainage off and away from the road surface.

4. A road that deteriorates suddenly should not be used until repairs are effected. Bypasses 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 C.A.L.M. and relevant Industry personnel to ascertain the cause and prevent repetition if possible.

6. Roadside scrub clearing must be carried out according to T.I.R. Act requirements. The cost of such work must be borne by the road user, as decided and directed by the Forest Officer in Charge.

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SECTION 2 - ROADING

SPECIFICATION 2.4 GRAVEL PIT SELECTION WORKING AND REHABILITATION

Note: The term "gravel" also applies to other basic raw materials such as sand, limestone and quartz.

1. The use of existing or new gravel pits for logging road construction and/or maintenance must be approved by the Forest Officer in Charge, and must confirm with Policy Statement Number 2 (January, 1986) a summary of which is attached (Attachment 2.4.1).

2. The pit selection must be carried out in conjunction with the planning of log haul routes. This implies a two year lead time. Selection of pits must take into account the following:

   * Location of pits must be rationalised to avoid numerous small, scattered pits.
   * No pit shall be located within road, amenity or stream reserves.
   * Pits must be located out of sight of features such as public roads, scenic lookouts and recreation areas.
   * Pits must not be located in areas likely to create severe drainage and/or erosion problems particularly if rehabilitation is likely to be delayed.
   * Access tracks into pits must be located to avoid direct line of sight into the pits.

3. The dieback status of pits must be decided by C.A.L.M., with sampling and laboratory testing if necessary.

4. Operation of pits:

* Boundary of clearing must be marked by a Forest Officer with white paint crosses.
* Utilization of forest produce must be arranged by the Forest Officer in Charge.
* Debris, free of topsoil, must be cleared into heaps or windrows at a distance of not less than 5m from standing trees.
* Top soil to a depth of at least 30cm must be stripped and stockpiled in conveniently situated heaps on the perimeter of the cleared area, at distances of not less than 5m from standing trees or heaps of debris.
* If the pit is classed as dieback-free, then removal of gravel resource must be strictly in accordance with split phase standards; that is:-

  (a) a log barrier must be strategically positioned on the perimeter of the pit entrance to prevent entry of gravel trucks onto the pit floor occupied by the loader,
  (b) loading facilities will be designed to prevent ground contact between the loader and gravel trucks, and
  (c) loaders entering or re-entering the pit must be thoroughly cleaned down.
  (d) the flow of water into the pit, from dieback-infected forest or roads, must be prevented.

* Pits developed specifically for logging roads must be physically closed when logging is complete.

5. Rehabilitation of pits:

An exhausted pit, or exhausted parts of a large pit, must be rehabilitated by the user when, and as directed by, the Forest Officer in Charge, using the following guidelines:

* Clearing debris must be burnt and the ashes spread over the floor of the pit.
* Stockpiled top soil must be spread evenly on the floor of the pit.
* Banks of the pit must be battered to an angle no greater than 10^{o}.
* The floor of the pit must be ripped, along the contour, to a depth of 500mm at 1m intervals. Ripping may take place before or after spreading of topsoil, depending on the depth of topsoil. In most instances it is best to rip after spreading of topsoil.
* The pit must be drained where necessary to prevent ponding of ground water.
* Erosion control drains or barriers must be constructed as required.
* If the pit is completely exhausted, the pit access road must be ripped to a depth of 500mm at 1m intervals, parallel to its length.
* Indigenous, dieback resistant tree species, and nitrogenous understorey species must be planted on the rehabilitated pit and access road during the first winter period following preparation for rehabilitation.

Earth works are to be carried out and funded by the pit user. Tree planting is to be carried out and funded by CALM.

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SUMMARY OF CALM POLICY STATEMENT NO. 2 (JANUARY 1986)
BASIC RAW MATERIALS

AGENCY	TENURE	MINING TENEMENT	CALM LEASE	REHABILITATION PITS	COMPENSATION TO CALM	ROYALTY M.D.	ROYALTY CALM	APPROVALS	REMARKS
1. CALM	Use on CALM lands	No	No	Yes	No	No	N/A	CALM District	Minimal pits on National Parks, Nature Reserves and Flora, Fauna and Landcape priority areas. All pits to be rehabilitated after use.
2. CALM agents authorised	Use on CALM lands	No	No	Yes	No	No	N/A	CALM District	Minimal pits on National Parks, Nature Reserves and Reserves and Flora, Fauna and Landcape priority areas. All pits to be rehabilitated after use.
3. Shires, MRD or other authorised agencies	* Roads on or servicing CALM land or within 5km	No	Yes	Yes	No	No	N/A	CALM District	Minimum of new pits on National Parks, Nature Reserves or Flora, Fauna and Landscape priority areas. Existing pits to be phased out and rehabilitated
4. Shires, MRD or other agencies	* Commercial use or land not adjacent (more than 5km)	Yes	No	Yes	Yes	Yes	No	CALM would oppose mining tenements	No new pits on National Parks, Nature Reserves or Flora, Fauna and Landscape priority areas. Existing pits to be phased out and rehabilitated.
5. Contractors	For use on other tenures or on P.P.	Yes	No	Yes	Yes	Yes	No	CALM would oppose mining tenements	No new pits on National Parks, Nature Reserves or Flora, Fauna and Landscape priority areas. Existing pits to be phased out and rehabilitated.
6. Private Individuals -small lots	For use on P.P.	-	No	-	-	-	-	-	Obtain from contractors

SECTION 3 - SILVICULTURE

SPECIFICATION 3.1 JARRAH SILVICULTURE

1. Jarrah silviculture guidelines and specifications are the responsibility of the Silviculture Branch, Forest Resources Division. Documents relevant to jarrah silviculture include:-

   (a) "Silviculture Treatment of Jarrah Forest for Wood Production", F.J. Bradshaw (Nov 1983)
   (b) "Treemarking and Silviculture in the Jarrah Forest", F.J. Bradshaw (1985) (reviewed 1987).
   (c) "Silviculture Guidelines for Virgin Southern Jarrah Forest", F J Bradshaw 1986 (Tech Report N^{O} 4)
   (d) "Jarrah Silviculture Specification, 1/87
   (e) "Jarrah Silviculture Specification, 2/87

2. Silviculture, particularly in the jarrah forest, must be given due consideration prior to the commencement of cutting. In particular, the "Coupe Cutting Prescription" form (CLM 093) must be carefully completed prior to the commencement of tree marking.

   Aerial photos should be used to assist in gaining an overall picture of the area to be cut.

3. A summary of current jarrah silviculture is as follows:

   3.1 Objectives: In an area to be cut silviculture should aim to achieve one of the following objectives -

   (a) reduce competition to allow seedlings to develop into ground coppice (i.e. with large lignotubers). In these instances a part of the overstorey is removed, thus allowing seedlings to emerge and develop into ground coppice.

(b) allow ground coppice, or advance growth, to develop into saplings, poles and ultimately merchantable trees, without impediment. In these instances the complete overstorey is removed, up to a maximum area of 10ha.

(c) promote growth on retained (crop) trees. This is the most common objective in the N.J.F. because of the prevalence of jarrah regrowth from past cutting. In these instances a basal area of at least $10m^2$/ha of crop trees must be retained.

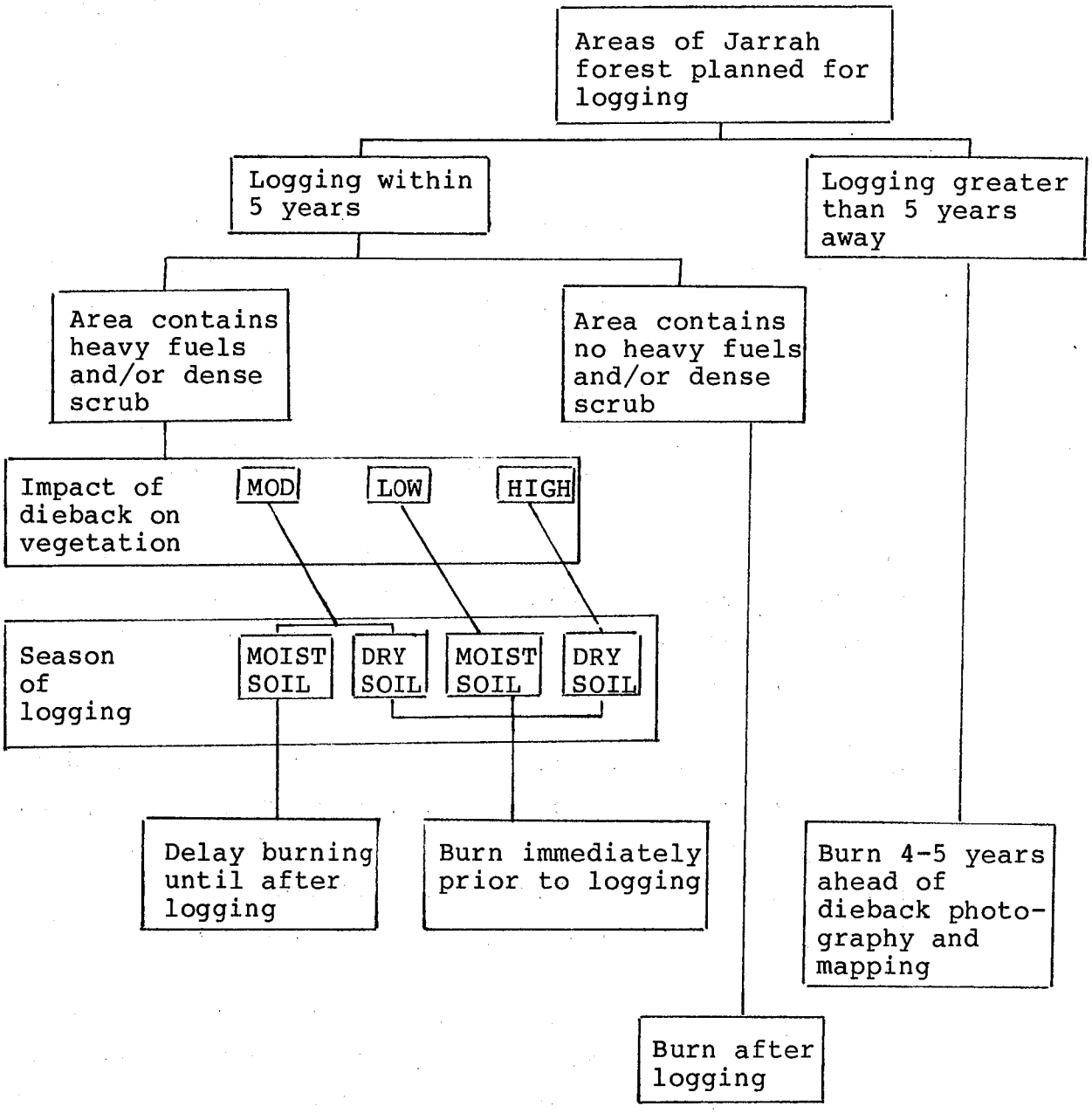
Only one of the above three objectives should be pursued in any one patch of forest at any one time. The desirable minimum size of this patch is four times the mature tree height in diameter.

3.2 Advance Burning: (ie, prescribed burning in advance of logging)

Normally, areas of jarrah forest due to be cut within the next three years should not be burnt. This ensures dieback indicator plants are available for interpretation.

However, if suitable dieback maps have already been prepared, advance burning may be undertaken for reasons of access, safety and silviculture, in accordance with the "Decision Guide" below:-

Guidelines for burning areas of heavy fuels, including dense scrub in association with logging operations in the jarrah forest



NOTE: with implementation of these guidelines:

1. Fire Protection Branch will need to investigate techniques of burning that aim at reducing fire intensities in post logging burns.
2. Silviculture Branch will need to develop improved methods of assessing regeneration on moderate impacting vegetation site types.
3. Operations staff will need to review planning in order to limit the area of moist soil, moderate impacting vegetation types that are logged annually.

3.3 Tree Marking: Because of the variability of the jarrah forest, a fixed tree marking prescription will not work for every stand. Rather, the tree marking prescription adopted should suit the stand in question and be flexible enough to cater for changes in the stand. Tree markers must therefore have a sound understanding of the document "Tree Marking and Silviculture in the Jarrah Forest" (Bradshaw, 1985; reviewed 1987) and any specifications issued to complement this document.

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SPECIFICATION 3.2 WANDOO SILVICULTURE

1. In areas where wandoo is cut, C.A.L.M. staff should consult the booklet "Interim Rehabilitation and Protection Programme for Wandoo", F.J. Bradshaw (Nov. 1983).

SPECIFICATION 3.3 KARRI SILVICULTURE

1. Karri silviculture guidelines and specifications are the responsibility of Silviculture Branch, Forest Resources Division. Documents relevant to karri silviculture include:

   "Silvicultural Guidelines for the Treatment of Even-aged Regrowth and Two-tiered Karri Forests", F J Bradshaw (1985) (Tech Report N^{O} 1)

2. Clearfelling

   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.

3. Clearfelling with Seed Trees

   3.1 Cutting to Seed Trees

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

   3.1.1 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).

3.1.2 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 void of suitable seed trees will be clearfelled and planted.

3.1.3 Seed Tree Species:

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

3.1.4 Seed Tree Protection:

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

3.1.5 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.

3.2 Removal of Seed Trees:

The objective of the operation is to remove seed trees with the minimum of damage to seedlings and soil.

3.2.1 Seed trees which are burnt in the summer months (December to February 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 Timber Production. 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 Timber Production.

3.2.2 In some cases the Industry 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.

3.2.3 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 Industry Supervisor, 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.

3.2.4 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 or 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.

3.2.5 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.

3.2.6 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.

4. Thinning Karri Regrowth and Two-Tiered Karri Forests

4.1 These stands will be marked for retention, the intensity varying with both site and age as reflected by co-dominant height. Control will be by basal area (Table 1) with the proviso that stocking density does not fall below 90 stems per hectare (ie, 10.5m x 10.5m) spacing. Refer to "Silviculture Guidelines for the Treatment of Even-aged Regrowth and Two-Tiered Karri Forests" (CALM Technical Report N^{O} 1; Bradshaw 1985).

Table 1

Co-Dominant Height (m)	BAOB Retained (m^2/ha)
Less than 29	Delay Thinning
29 - 31	8
32 - 34	10
35 - 37	12
38 - 41	14
42 - 45	16
46 - 48	18

4.2 Trees retained, in order of priority, should be:

4.2.1 In the dominant and co-dominant class

4.2.2 Healthy crown

4.2.3 Good form without excessive branching

4.2.4 Selected with due regard to spacing (closer spacing will be necessary at the edges of gaps)

4.2.5 Marri regrowth may be retained as crop trees when no suitable karri exists

4.2.6 Minor existing butt damage in vigorous, well growing trees, can be tolerated. (Regrowth stems immediately adjacent to major snig tracks should be favoured for removal).

4.3 Veteran trees will be removed after the thinning is completed provided they can be removed without damage to growing stock and if there is a regrowth stem or stems to fill the gap created. This must be borne in mind when selecting crop trees. Smaller vigorous "veterans" which will continue to produce sawlog may be left as growing stock if it is the only stem effectively occupying the site.

4.4 A buffer of unthinned forest of 20m width will be retained around Private Property and other large openings, to reduce wind velocity. These buffers may be thinned 3 years after the adjacent forest is thinned.

5. Other operations

5.1 Coupe Control will be as per Section 4.

5.2 Extraction tracks should be selected to minimise the possibility of butt and root damage by snigging. The major extraction track should be straight (to minimise damage) and located beneath veterans where possible. A system of secondary tracks on a "herring bone" system should be used.

5.3 Advance burning is required 3-5 years before thinning to allow access and to reduce the intensity of the tops disposal burn.

5.4 A tops disposal burn will be carried out as soon as possible after an area has been thinned.

5.5 Tops disposal around retained stems is to be carried out by the contractor. All fresh debris in excess of 75mm diameter should be removed to at least 1m from crop trees, subject to change in accordance with contractual specifications.

5.6 Landing debris is to be heaped at least 5m from crop trees.

5.7 Systematic measurements of co-dominant height and basal area are to be carried out by the Forest Officer at the completion of each section as a check on quality control.

6. Environmental Considerations

6.1 All standard environmental constraints and dieback hygiene measures during logging will apply with the following exceptions:

* There will be no constraint on coupe size.

* Thinning is allowable in road reserves following approval from the Regional Manager.

6.2 Soil damage:

6.2.1 Maximum soil damage levels will be 10% Class 1 and 2, including loading areas (see specification 5.2)

6.2.2 Shallow raking of snig tracks and landings may be carried out to promote scrub germination if considered necessary by the Forest Officer. Deep ripping will not be carried out because of damage to established root systems.

6.2.3 Erosion control on slopes will be done according to Specification 5.2

7. Stem Damage to Crop Trees

Damage assessments will be carried out on a regular basis.

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SECTION 4 - COUPE CONTROL

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 by Regional Inventory office 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 precise geographical location. Aerial photos will assist. Roads and other features plotted on Departmental maps cannot be assumed to be accurate.

2. Sub coupes 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. Ridge lines may be marked permanently using white painted blazes on four sides of trees.

4. Stream reserve, road reserve 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. The exact location of boundaries of stream, road and amenity reserves is as decided by the Forest Officer in Charge, using the following guidelines:-

4.1 River and Stream Reserves

General:-

- Width of river or stream reserves is dependent on vegetation type, slope and susceptibility of the soil to erosion.
- A river or stream reserve is measured from the outside edge of the stream zone vegetation.

In Woodchip Licence Area:-

- Width of river reserve is 200m on each side of river.
- Width of stream reserve is 100m on each side of stream.

Elsewhere:-

- For all second or third order watercourses within 3km of a catchment reservoir, the width of the stream reserve must be a minimum of 100m on each side of the watercourse, and a minimum of 50m for other streams. (See Fig.4.1.1 for explanation of stream orders).
- For watercourses outside the 3km zone, but within harnessed catchments, the respective minimum widths must be 50m and 25m.
- For watercourses in non-harnessed catchments, stream reserve widths will be at the discretion of the Forest Officer in Charge.

4.2 Road Reserves

In Woodchip Licence Area:-

- 400m in width, on both sides of major roads.

Elsewhere:-

- 100 to 200m in width, on both sides of major roads.
- Between 0 and 100m on both sides of other roads.
- Some selective cutting may be allowed within road reserves, as directed by the Forest Officer in Charge.

4.3 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.

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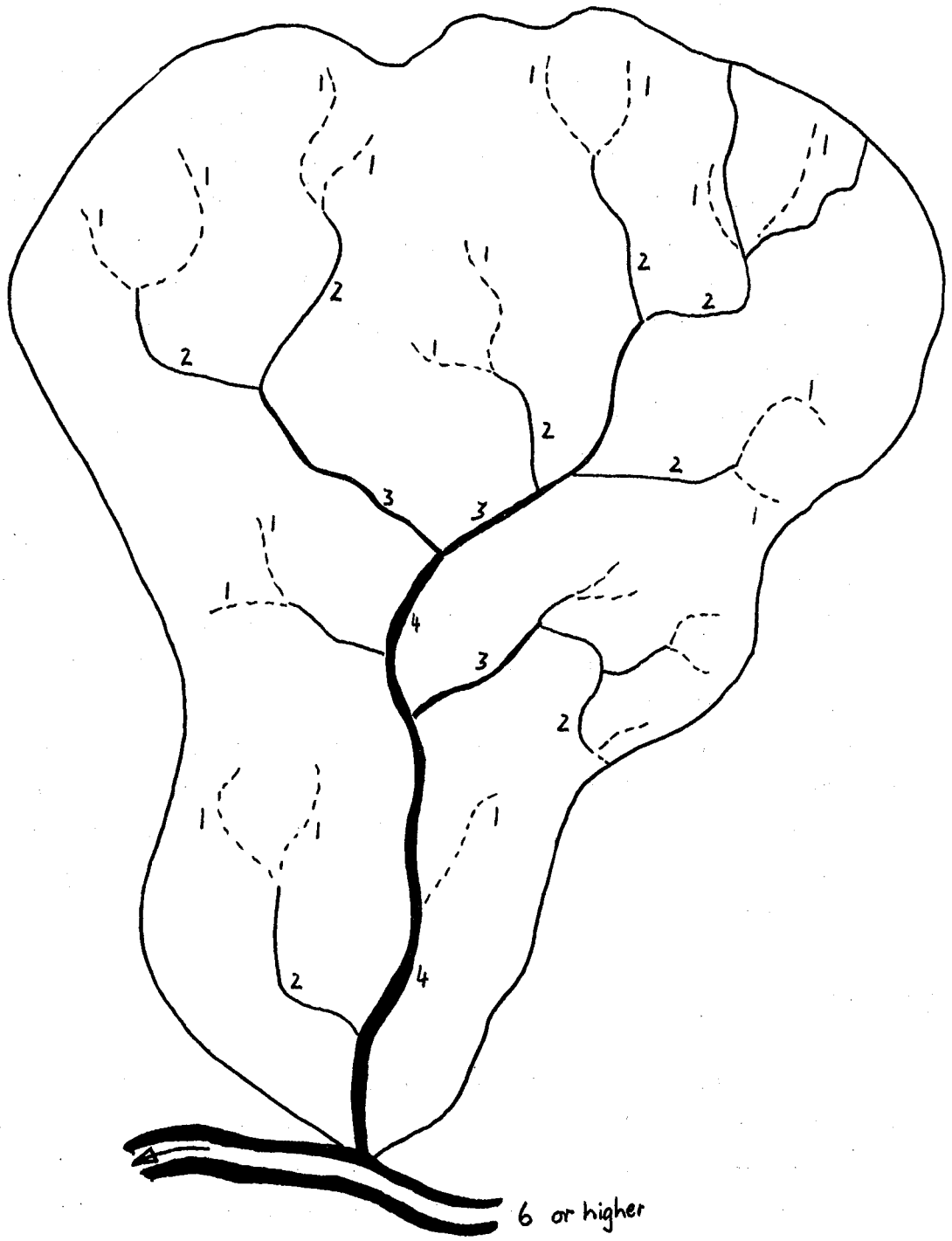

Figure 4.1.1 Stream Orders.

SECTION 4 - COUPE CONTROL

SPECIFICATION 4.2 FALLING (INCLUDING TREE MARKING TECHNIQUES)

1. Fallers' Blocks

- Control of falling is by the system of fallers' blocks i.e. the allocation of areas of forest (known as "fallers blocks" or "subcoupes") in approved coupes to individual registered fallers or individual tree harvesting machines. The areas must be demarcated by white tape prior to commencement of cutting.
- Fallers' blocks must be demarcated by the bush boss and approved by the Forest Officer.
- The size and shape of a faller'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 faller or tree harvesting machine.
- Normally, all timber on a faller's block will be extracted to a single landing, on the edge of that faller's block.

A faller will not be allocated more than two faller's blocks at any one time. Unless specifically approved by the Forest Officer, a third faller's block will not be allocated until one of the first two blocks is cut to the satisfaction of the Forest Officer.

2. Tree Marking

Trees to be removed from an area may be indicated to fallers 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.

2.1 Tree marking for removal: trees may be marked for removal using -

(a) an axe, or (b) paint.

(a) Axe: 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.

(b) Paint: Trees marked for removal with paint must be painted on two sides, at least 1.5m above the ground, with a cross with strokes about 60cm long, and a dot at the base of tree to indicate the desired direction of fall. Only orange paint, clearly visible to fallers, may be used for tree marking for removal.

In areas where trees are marked for removal by either of the two methods described, no other trees may be felled.

2.2 Tree marking for retention: trees may be marked for retention using (a) paint or (b) tape.

(a) Paint: 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. Only orange paint may be used.

(b) Tape: trees marked for retention with tape must have a single tape tied around the tree at a height of at least 1.5m above the ground. Only orange tape may be used.

In areas where trees are individually marked for retention, fallers may cut any other tree they consider contains usable produce under the terms of the relevant licence or contract.

A group of trees may be marked for retention by using orange tape tied around trees along the perimeter of the group. At least one tree in every 10m of perimeter must be marked, and the knots in the tape must face away from the centre of the group. The Bush Boss must be advised by a Forest Officer of areas containing groups marked for retention.

3. Scrub Rolling

Scrub rolling prior to felling may be necessary. 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. Trees leaning into road, stream or amenity reserves must not be felled unless specifically indicated for removal by a Forest Officer.

6. All stumps, and all logs prepared by a faller, must be branded with the faller's brand immediately after cutting. (This rule does not apply if felling is carried out by a tree harvesting machine).

7. All fallers must comply with safety requirements as directed by T.I.R. Act District Inspectors.

1 November, 1987

SECTION 4 - COUPE CONTROL

SPECIFICATION 4.3 EXTRACTION

1. Extraction (or snigging) of logs is controlled by the system of faller's blocks (or subcoupes) in the same way as felling. That is, an individual logging unit will be allocated two fallers's blocks (or sub-coupes) and will not be allocated a third until one of the first two is utilised to the satisfaction of the Forest Officer.

2. Snig track patterns in individual faller's blocks or sub coupes must be planned and demarcated by the Forest Officer and Industry Bush Boss together, or, when approved by the Forest Officer in Charge, by the Bush Boss alone. Snig tracks should adopt a herringbone pattern leading downhill whenever possible. Snig tracks are to be indicated using (a) red and white flagging tape together on individual trees or bushes, or (b) axe blazes on trees or bushes.

3. The location of landings must be planned and marked, using the same techniques as for snig tracks, by the Forest Officer and Industry Bush Boss together. Normally, one landing will be allocated to each faller's block or sub-coupe.

4. Landings must use existing gaps in the forest whenever possible. Topsoil must be stockpiled to one side of a landing and clearing debris must be heaped at least 5m away from retained crop trees. One or two large heaps or windrows is preferred to a number of smaller heaps.

5. Split phase logging:
   In dieback-free forest, 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. There are four different techniques in "split-phase logging":

5.1 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 commence. That is, once loading and hauling commences, a skidder must not return to the sub coupe or faller's block. If a skidder is required to return, it must be cleaned down before each trip into that sub coupe or faller's block. The number of times a machine is permitted to enter a sub-coupe of faller's block must be kept to a minimum. A Forest Officer may require a machine to be inspected prior to each entry.

5.2 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 is situated at the 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 soil, brought in by log trucks, into the sub coupe. Skidding and loading can take place concurrently. There must be no contact between the loader and the truck. Turnarounds must be constructed in order to avoid the need for the loader to lift or pull trucks closer to the loading position.

5.3 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 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. In this technique the barrier must not be allowed to shift from the landing onto the road. This can occur when large volumes are loaded out during moist soil conditions.

5.4 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.

6. In dieback-free forest, 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.

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

8. At the completion of extraction, all major snig tracks in dieback-free forest must be blocked by a physical barrier such as a log.

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

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SECTION 4 - COUPE CONTROL

SPECIFICATION 4.4 LOADING AND HAULING

1. In dieback-free forest, the loading operation must conform with the techniques of "split-phase logging", described in Specification 4.3.

2. The log hauling route or routes used must be approved by the Forest Officer in Charge. Traffic control signs must be displayed along these routes as required by the Forest Officer in Charge or the T.I.R. Act 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.

   (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 wet weather if, in his opinion, continued haulage is likely to result in damage to the road or excessive turbidity in adjacent streams.

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SECTION 4 - COUPE CONTROL

SPECIFICATION 4.5 LOGGING OPERATION INSPECTIONS AND CERTIFICATION

1. Forest Officers must check logging standards periodically on a faller's block by faller's block (or sub-coupe by sub-coupe) basis to ensure falling and extraction standards are maintained. Whenever possible the Industry Bush Boss must accompany the Forest Officer on these inspections so that problems found can be rectified immediately.

   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 by not removed
   - damage to retained (crop) trees by falling and/or skidding
   - extraction pattern
   - soil damage
   - dieback hygiene
   - tops disposal.

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 bush boss in attendance. At the completion of such an inspection a report must be completed. Two report forms are available:- (i) CLM 106 - this form has been developed for use in the Northern and Central Forest Regions. It comes in book form, with tear out copies for Industry representative and CALM Regional office. (See Attachment 4.5.1). (ii) CLM 105: - this form has been developed for use in the Southern Forest Region. (See Attachment 4.5.2). These forms 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 company.

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

The progress of these inspections must be recorded on form CLM 104 (See Attachment 4.5.3). One of these forms must be kept by the officer in charge of each logging coupe. This form is the official permanent record of the progress of completed cutting. The logging company will not be expected to return to a faller's block or sub-coupe once it has been certified, except for any rehabilitation work that may be required.

The authority to certify faller's blocks or sub-coupes may only be allocated to experienced Forest Officers. These "Certifying Officers" must be authorised by the relevant Regional or District Office.

3. During any inspection the Forest Officer must use only yellow lumber crayon to initial and date stumps, and cross out unmerchantable timber. These markings will indicate that the area has been inspected. The Industry Bush Boss must use only white lumber crayon to mark trees or logs.

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

1 November 1987

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

C.L.M 106
1987

HARDWOOD LOGGING INSPECTION & ACTION SHEET

Inspection Date ...../...../.....

District ..... Block .....

Compartment/Coupe ...../..... Sub-Coupe .....

Forest Officers ..... Industry Rep. .....

Contractor ..... Faller .....

1. UTILISATION

Log Dressing at Stump .....On Landing .....Stump Height .....

Logs to be Extracted to Landing .....

Crown Logs to be Cut .....

Trees to be Fallen for SAW LOGS ..... POLES ..... OTHER (specify) .....

Damaged C.T's to be removed SAW LOGS ..... POLES ..... OTHER (specify) .....

Strategic C.T. Removal SAW LOGS ..... POLES ..... OTHER (specify) .....

2. CONTROL

Crop Tree Damage by Fallers ☐ Acceptable ☐ Excessive ☐ Assessment Required

Crop Tree Damage by Machines ☐ Acceptable ☐ Excessive

Comments/Action .....

Crop Tree Protection ☐ Required by Industry ☐ Done by Industry ☐ Required by C.A.L.M.

Erosion Control & Drainage ☐ Required by Industry ☐ Done by Industry

Soil Conditions ☐ Moist ☐ Dry

Landing Rehabilitated — Debris Stacked YES NO

Landing Drained & Ripped YES NO

Shunt Rehabilitated & Ripped YES NO

Action Item .....

3. DIEBACK HYGIENE PRACTICES

Hygiene Failures NOTED NOT NOTED

Comments:- .....

.....

4. SAFETY FALLING ..... EXTRACTING .....

LOADING ..... CARTING .....

5. FIRE PRECAUTIONS .....

6. COPY OF ACTION ITEMS GIVEN TO .....

Action Items explained full to Industry Rep. .....

7. TARGET DATE FOR COMPLETION OF ACTION ITEMS / / Field Check Date / /

8. FURTHER COMMENTS .....

.....

.....

FOREST OFFICER'S SIGNATURE

9. INDUSTRY REP. COMMENTS .....

.....

INDUSTRY REP. SIGNATURE

10. F.O.I.C. SIGNATURE ..... DISTRICT MANAGER SIGNATURE .....

DATE / / DATE / /

DISTRIBUTION: WHITE ORIGINAL — INDUSTRY REP.; GREEN DUPLICATE — C.A.L.M. REGION; YELLOW TRIPLICATE — DISTRICT (Stays in Book)

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT
HARDWOOD HARVESTING INSPECTION AND ACTION SHEET (S.F.R.)

District .....
Licence .....
Coupe .....

Present doing inspection:
CALM Officers.....
.....
Industry .....

DEPARTMENTAL CONTROLS:

- Coupe Demarcation (including river, stream & road reserves) .....
- Coupe sign .....
- Hygiene Boundaries (incl.ridgelines) .....
- Special Buffers (swamp, rock) .....
- 1:12,500 Coupe Sheet .....
- Faller's Block Demarcation .....
- Special Care Zones (recognised watercourses and steep slopes) .....
- Completion of and compliance with 7 Way Test .....
- Quarantine Permit .....
- Treemarking (Crop trees, Seed Trees) .....
- Log Segregation .....
- Delivery Note Checks (both chiplogs & sawlogs) .....
- Remarks .....

COMMENT ON INDUSTRY OPERATIONS:

- Roading .....
- Scrub Rolling .....
- Landing & Snig Track Location .....
- Completion of Blocks & Landings .....
- Soil Disturbance .....
- Care of Watercourses .....
- Erosion Control .....
- Protection of Crop Trees .....
- Log Segregation .....
- Delivery Note Completion .....

COMMENT ON INDUSTRY UTILISATION

- Stump Height .....
- Long Butting .....
- Crowning off .....
- Sawlog Utilisation .....
- Log and Stump Branding .....
- Remarks .....

ACTION REQUIRED BY CALM: _____

ACTION REQUIRED BY INDUSTRY: _____

DATE ..... INSPECTING OFFICER'S SIGNATURE .....

NOTE: Completed original to go to the District Timber Production Officer plus one copy to the Logging Contractor.

Attachment 4.5.3

CLM 104 (1987)

CONSERVATION AND LAND MANAGEMENT

FALLER' BLOCK (OR SUBCOUPE) CERTIFICATION SHEET

DISTRICT ..... BLOCK/CPT .....

COUPE ..... OFFICER IN CHARGE OF COUPE .....

llers ɔck Sub ɹpe ɔ.	Preliminary Inspect. By Forest Off-icer. Items found.	Date	Final Inspect. by Certifying Officer. Items found.	Erosion Control and Spacing	Branding Standard accept-able. Y/N	Block Cert (Y/N)	Landing Cert (Y/N)	Date	Cert. Officer Sign.	Ind. Rep. Sign.

Abbreviations: J = Jarrah Sawlog
K = Karri Sawlog
B = Blackbutt Sawlog
MCH = Marri Chip
KCH = Karri Chip

P = Pull
F = Fall
C = Cut
NR = Not required

SECTION 4 - COUPE CONTROL

SPECIFICATION 4.6 BUSH STOCKPILING

1. Bush stockpiling is the practice of stockpiling logs in the forest to supplement mill stockpiles. Bush stockpiles are not designed to replace mill stockpiles, but are to enable Industry to continue log haulage during periods of the year when extraction is not permitted. Mill stockpiles should always be preferred to bush stockpiles.

2. Industry must obtain permission for bush stockpiling from the Forest Officer in Charge. Bush stockpiling should not start before the onset of cooler weather in early autumn. This coincides with a reduction in activity of the Lyctus Borer.

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 logs in bush stockpiles must be removed to a mill by 15 October in any year.

5. To prevent degrade, the ends of all logs should be painted with a sealing compound after placement in a bush stockpile. Once a prepared log is placed in a bush stockpile, no docking is permitted at any later date.

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

1 November, 1987

SECTION 4 - COUPE CONTROL

SPECIFICATION 4.7 LOG SEGREGATION PROCEDURE FOR BUSH LANDINGS IN CHIPWOOD LICENCE AREA

1. Forest Officers will ensure that all Karri, Marri, Jarrah, Blackbutt and Tingle sawlogs, including second grade sawlogs, are identified and marked by sawmill licence holders or their nominated representatives at the bush landing.

2. Sawlogs which will obviously be accepted for sawing by the respective Head Office licence holders shall be delivered by the customers contractor.

3. Potential sawlogs which are in dispute between H.O. licence holders and their contractor shall be inspected at the bush landing by the Forest Officer and the licence holder, and a decision made. Such logs will be clearly marked and branded by the Forest Officer as specified in Section 5 below.

   Initial segregation of first grade sawlogs should be completed before logs are made available for inspection by "salvage" sawmill representatives.

   Second grade (salvage) logs will similarly be inspected by "salvage" operators and the Forest Officer. Once a decision is made, logs will be marked and branded.

   Second grade sawlogs may be delivered by CALM's contractor at agreed prices, or by the customers contractor. Preference is for CALM's contractor to carry out this work.

4. Two types of "salvage" licence holders are recognised:

4.1 A local Forest Produce (Sawmilling) Licence Holder (L.L.) shall have first choice in defined coupes, of logs not considered suitable as first grade sawlogs. (Allocated by the Regional Leader Timber Production). Currently four L.L. mills are authorised: McLean, Denmark; Gandy, Jardee; A.T.P., Yornup; Rijavec, Manjimup. Note Gandy has first choice of Marri sawlogs in all coupes.

4.2 A Pre-Paid Minor Forest Produce Licence holder (P.P.L.) will be authorised by Districts, to select logs rejected by the L.L. holder. Coupes will be allocated to P.P.L. mills. Marri logs rejected by Gandy may also be offered to L.L. or P.P.L. mills or sold by auction.

5. Marking Procedure

First Grade Sawlogs will be marked (1)
Potential Second Grade (L.L.) will be marked (2)
Chiplogs will be marked (3)

Logs marked (2) by the H.O. sawmill representative will constitute a formal refusal after which time logs may be inspected by "salvage" licence holders. Logs accepted by a "salvage" operator will be branded with a personal brand circled with blue chalk. Rejected logs will be crossed with blue chalk and branded.

Forest Officers will initial logs rejected for sawmilling and classify as chiplogs by writing "chip" on the end of the log.

Forest Officers will use yellow chalk exclusively.
Contractors will use white chalk exclusively.
"Salvage" mill representatives will use blue chalk exclusively. (Various colours of spraypaint may be allocated to mills for winter use).

6. Special logs to be segregated include Karri Peeler Logs, S.E.C. Poles, Bridge Timbers and Small sawlogs destined for Moniers batten mill.

7. The right is reserved by the Forest Officer to select and mark potential sawlog previously identified by the contractor as chiplogs. Such logs will be pulled out of the chiplog stack by the contractor for proper inspection. For any potential sawlog identified the procedure above will apply.

8. The C.A.L.M. Department will inspect logs on bush landings a minimum of once every second working day. Additional inspections may be arranged on request.

9. "Salvage" Allocation

The areas nominated for each "salvage" mill are not fixed and areas allocated may be changed according to second grade sawlog requirements. Such changes will be approved by the Regional Leader Timber Production. Salvage rights in some coupes will be determined by auction or tender. In either event, the logging contractor will be notified.

10. To ensure there is no possibility that sawlogs may inadvertently be chipped the Department shall continue to inspect logs delivered to the Diamond Chipmill to identify potential sawlogs. Those logs marked as chiplogs by a Forest Officer at the bush landing shall not be re-classified.

11. Logs identified by the Department as sawlogs, including second grade sawlogs, shall be loaded onto the respective log contractor's truck and returned to a bush landing or appropriate sawmill. The additional costs will be borne by the log contractor.

SECTION 4 - COUPE CONTROL

SPECIFICATION 4.8 LOG SEGREGATION AT W.A.C.A.P. CHIPMILL LANDING

1. Segregation Procedure

1.1 After unloading is completed, any potential sawlog must be clearly marked for removal and the loader driver instructed using two-way radio or clear signals as to the log's destination. ie: specific sawlog stack or docking area. Logs previously dealt with and signed by a Forest Officer and marked as "chip" will be chipped without re-classification.

1.2 The end of each sawlog must be clearly marked with the coupe identification and contractor. Yellow paintstick should be used.

1.3 Logs for docking must be clearly marked with an arrow to indicate the cross cutting point. After docking, acceptable sawlog sections will be branded with the C.A.L.M. hammer and identified before placement in the nominated sawlog stack. Sawlogs will be returned to the bush by the logging contractor or delivered to a nominated mill.

1.4 Potential mill logs at the splitting bay must be marked with a yellow line, to indicate best splitting direction to maximise sawlog sections. Millable sections so produced, must be branded and identified before transport to nominated sawlog stack.

2. Safety Requirements

2.1 Every officer whilst working on the chipmill landing must wear the prescribed protective equipment (safety helmet, boots and vest). Goggles are prescribed for dry, dusty conditions.

2.2 When a truck is being unloaded the officer must locate himself on the loader side of the truck. Chains must not be released until the loader is supporting the load. Note: Logs have been known to roll as far as the debarker; and to bounce and roll at 90^{o} to the landing after unloading.

2.3 Officers must not climb on log stacks.

3. General

3.1 Karri Thinnings chipwood deliveries must be spot checked for possible "Monier" logs. Debarking and leaf removal standards must also be checked.

3.2 Sawmill representatives should accompany the Forest Officer when sawlog stacks are being checked.

3.3 Delivery Notes must be checked at the prescribed minimum level of 5%.

1 November 1987

SECTION 4 - COUPE CONTROL

SPECIFICATION 4.9 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-free forest.

3. White painted blazes on four sides of a tree (permanent)
   - ridge line.

4.* Red Flagging Tape (i.e. tape with ends able to move in breeze)
   - sub-coupe boundary
   - ridge line

5.* White Flagging Tape
   - faller's block

6. Orange painted band around a tree
   - tree marked for retention (crop tree or seed tree)

7.* Orange tape tied around a tree
   - tree marked for retention (crop tree or seed tree)

8.* Orange tape tied around a number of trees in a rough circle
   - a group of trees marked for retention (crop trees); the knots in the tape in this situation must all face away from the centre of the group of trees to be retained.

9. Orange painted crosses on two sides of a tree with same coloured dot at base of the tree
   - tree marked for removal, the dot indicating desired direction of fall.

10. 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.

11.*Red flagging tape and white flagging tape tied, one above the other, around a tree or bush
   - landing extremity
   - major snig track

12.*Yellow flagging tape tied around a tree
   - tree, missed by faller, which must be felled (if considered by faller to be safe).

13.*Yellow flagging tape tied around a log, or stick or bush adjacent to a log
   - log, missed by feller or skidder, which must be cut and/or extracted.

14. Yellow lumber crayon on a stump or log
   - used by a Forest Officer to instruct Industry and/or record inspection of a logging operation.

15. White lumber crayon on a stump, log or tree
   - used by Industry bush boss instruct to bush crew and/or record inspection of a logging operation.

16.*"Dayglo" pink tape tied around a tree or bush
   - danger sign, used to indicate presence of a dangerous situation such as tree hung-up, "widow-makers", etc.

17. Orange painted "S" on three sides of a tree

- tree marked for retention as a seed tree.

18. *~~Green~~ Dayglo orange flagging tape tied around a tree or bush

- initial dieback line marked in field by interpreters.

19. Blue lumber crayon on log

- used by "salvage" mill representatives in Southern Forest Region.

* Whenever possible, biodegradable tape should be used.

1 November, 1987

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.1 PROTECTION FROM JARRAH DIEBACK DISEASE

1. All CALM staff involved in hardwood logging must have a sound working knowledge of the biology and management of the dieback fungus, Phythophthora cinnamomi.

   References which should be readily available to staff include:-

   - Forest Focus No 31
   - Landscope No. 2
   - Information Sheet No. 4
   - Research Papers Nos. 3,10,40 and 65.
   - Bulletins 84 and 85.
   - Miscellaneous publication No. 1 - "Jarrah Root Rot".
   - Tech Papers No's 2 and 3
   - Dieback Hygiene Manual (July 1986)
   - Dieback 82
   - Policy Statement No.3 (attachment 5.1.1)

2. The implications of jarrah dieback must be considered during all phases of a logging operation, in particular during:
   (a) Planning (specifications 1.1, 1.2, 1.3 and 1.4)
   (b) Roading (specifications 2.1, 2.2, 2.3 and 2.4) and
   (c) Coupe Control (specifications 4.1, 4.3 and 4.4)

3. Machinery/vehicle cleandown

   3.1 A key part of forest management with respect to dieback is the cleaning down of vehicles and machinery prior to entering dieback free forest.

   3.2 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.

3.3 Cleaning down may be carried out using a variety of equipment involving water, compressed air or brushes, either at a CALM District headquarters, at a contractor's headquarters or in the field. When conditions are dry, compressed air is the preferred cleaning down technique, provided a machine or vehicle can be cleaned by such technique.

3.4 If water is used, then the fungicide sodium hypochlorite must 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.

3.5 Washdown sites in the field (that is sites involving water) must be approved by the Forest Officer in Charge. A washdown site must be on a well drained ramp or pad in dieback forest immediately adjacent to dieback-free forest. Such sites must be identified by a CALM Department "Washdown Site" sign.

3.6 All vehicle/machine drivers/operators must ensure that their vehicle/machine is clean prior to entering dieback-free forest. Forest Officers must regularly check the standard of vehicle/machinery cleanliness.

4. Dieback Sampling

Dieback sampling is an integral part of the job of dieback interpretation, and is not normally a task of CALM hardwood logging operations staff. If sampling is necessary for any reason, a detailed prescription and assessment sheet may be found in the CALM booklet "Dieback Hygiene Manual" (July 1986).

5. Dieback Demarcation

5.1 The initial marking of dieback boundaries in the field is done by CALM specialist staff responsible for dieback interpretation using large scale aerial photography. These officers will mark dieback boundaries using ~~yellow~~ Dayglo orange flagging tape on trees or bushes. The Forest Officer in Charge is then responsible for the permanent marking of the dieback boundaries using yellow painted blazes on three sides of trees. The FOIC must follow the ~~green~~ Dayglo orange tape marking, but may use his discretion to "smooth off" corners for practical purposes, provided the dieback line is shifted into dieback-free forest only. More detail on dieback demarcation procedures are contained in Attachment 5.1.2.

5.2 The FOIC may use wages employees to assist in the permanent marking of dieback lines. Close supervision must be carried out in such instances.

1 November 1987

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

POLICY STATEMENT NO 3 - DIEBACK AND LOGGING

NOVEMBER 1985 (Revised September 1986)

DIEBACK AND LOGGING POLICY - CALM DEPARTMENT

INTRODUCTION

The Policy Directorate is developing policies for the protection of National Parks, Nature Reserves and State Forests from dieback.

As the first step in this process, the Directorate has reviewed the former Forests Department's Dieback policy 1982 and its application to logging in State Forests. Decisions arising from this review are spelt out in this Policy Statement, together with guidelines for implementation.

POLICY

(1) CALM WILL CONTINUE TO IMPLEMENT DIEBACK POLICY 1982, IN ALL HARDWOOD LOGGING OPERATIONS IN STATE FORESTS.

(2) CALM WILL CONTINUE WITH THE EVALUATION OF OPERATIONAL PROPOSALS ON ALL ITS LANDS, USING THE 7-WAY TEST.

(3) CALM WILL CONTINUE WITH THE IMPLEMENTATION OF "POLICY 12".

COMMENT

These decisions recognise that although our dieback knowledge is incomplete (e.g., the terminal impact of the disease on all forest types is not yet clear) the Dieback Policy and 7-Way Tests are still appropriate management tools. This decision will stand until an integrated Departmental Dieback Policy for all CALM lands is developed, or until new research findings which affect the policy become available.

Operations on all Departmental lands must consider protection from dieback spread. However, the remainder of this paper will focus of HARDWOOD LOGGING operations in State Forests.

IMPLEMENTATION OF POLICY

Guidelines for the implementation of the Dieback Policy and 7-Way Tests for LOGGING different areas of hardwood forest are as follows:

(1) Forests South of the Preston River (see attached map - area 3).

1.1 Logging equipment will be cleaned down before entering and leaving a Karri dominant coupe. Current arrangements with respect to soil damage will continue, as prescribed in the Departmental Code of Practice and Industry Control Specifications Manual (ICSM).

1.2 Jarrah types will be logged using the most up-to-date hygiene precriptions. On low to moderate impact sites skidding under moist soil conditions with soil movement will be permitted. Current arrangements with respect to soil damage will continue, as prescribed in the (ICSM).

1.3 On sites where high impact is anticipated or the consequences are high (e.g., areas around Kirup, or where karri is upslope of high impact sites) logging under dry soil conditions only may be required. These areas will be automatically identified in the evaluation of the 7-Way Test, and appropriate conditions laid down before the 7-Way Test is approved.

Comment

This decision is based on the fact that few areas in the Southern forest show signs of high impact, though some deaths in the understorey and of jarrah trees have occurred on some sites.

Cessation of logging in the bush for a minimum of one month each year may be necessary to prevent soil disturbance and for hygiene in these vegetation types. These periods do not relate to specific calendar months.

(2) Forests in the Sunklands - (see map - area 2)

Jarrah types will be logged using the most up-to-date hygiene prescriptions. On the low to moderate impact sites skidding under moist soil conditions with soil movement will be permitted. Arrangements with respect to soil damage will continue as prescribed in the Departmental Code of Practice and Industry Control Specifications Manual.

Comment

This decision recognises that many areas of the Sunklands forest are dieback-free and that some are of high quality. Dieback hygiene, including dieback-free and impact mapping is required. Dry soil logging is preferred.

Cessation of logging in the bush for 5-6 months each year may be necessary so as to prevent soil disturbance, and improve hygiene. These periods do not relate to specific calendar months.

(3) Forests North of the Preston River (see map - area 1)

3.1 Logging machinery will be cleaned down before entering and leaving a wandoo dominant coupe. Current arrangements with respect to other environmental factors are prescribed in the Departmental Code of Practice and Industry Control Specifications Manual.

3.2 Jarrah types will be logged using the most up-to-date hygiene prescriptions. While the information on dieback impact is imprecise, logging under dry soil conditions will be maximised.

Cessation of logging in the bush for a minimum of 4 months and a maximum of 6 months may be necessary. These periods do not relate to specific calendar months.

Logging of dieback areas in moist soil conditions with soil movement is approved.

In dieback free areas, logging of low and moderate impact types (including most S types) in moist soil conditions, without soil movement is approved, provided that:

(i) the area is interpretable;

(ii) the area is accessible without placing high impact sites at risk;

(iii) the area is not upslope of high impact sites.

Moist soil logging will be directed to areas where dieback-free and hygiene maps are available, and where landform or site vegetation mapping has been completed. This applies both within and outside the Disease Risk Area.

Current arrangements with respect to other environmental factors are prescribed in the Departmental Code of Practice and Industry Control Specifications Manual.

Comment

These decisions recognise the sensitivity and importance of these forests, especially those on catchments in the zone of high salinity. Sensitive areas will be identified by the 7-Way Test and appropriate conditions laid down before the 7-Way Test is approved.

Syd Shea
EXECUTIVE DIRECTOR

September 19, 1986


SOUTHERN
OCEAN

DIEBACK DEMARCATION PROCEDURES

1. GENERAL

This guideline was prepared primarily by Mr A Brandis (I & P), in consultation with I & P, Operations and Protection staff. Officers of the Dieback Mapping Group (D.M.G.) should complete dieback demarcation within areas of forest for which Hygiene Maps have been prepared, as well as assisting Operations staff already involved in demarcation in forest outside D.R.A. (where Hygiene Maps do not exist). It is desirable to have a standard procedure for the completion of this task.

2. TIMING

All forest classified as Dieback, or Suspect should be demarcated as close to the time of logging as possible. If it is imperative that forest be burnt prior to logging, demarcation must be completed before burning.

When an operation has not taken place within six months of demarcation, it will be necessary to recheck (and demarcate again) all areas of forest downslope from dieback or suspect, particularly on moderate to steep slopes (greater than 5^{o}). Areas of forest that have been mapped as secure dieback-free (i.e. upslope from dieback, suspect, NEQ, uninterpretable) or that are relatively flat, should be rechecked after a period of twelve months.

3. DEMARCATION

Field demarcation of dieback or suspect is best achieved by blazing and painting non merchantable trees that occur at or near the boundary. All demarcation must be easily seen, even where dense scrub occurs. Trees should be blazed on three sides; two of the blazes should face along the boundary while the third blaze should face away from dieback or suspect. Blazes should be painted yellow.

The delineation of dieback or suspect should occur close to the visible disease symptoms. Officers should rationalise dieback or suspect boundaries when demarcating.

4. BUFFER ZONES

The system of mapping disease occurrence is based on visible symptoms that take varying periods of time, after infection, to manifest. As the most recent indicator plant deaths occur at or near the edge of disease infections, it is logical to conclude that P. cinnomomi may be in the soil, or root systems of both susceptible and resistant plants outside the visibly affected area, but that the susceptible plants may not have died. That is to say there may be some risk of transporting infected soil and root material from within a zone outside of but in close proximity to the infection. It is necessary therefore to have a zone which buffers forest operations from disease infections.

The buffer zones should be varied to account for the potential for disease to be present, but not manifest, under different vegetation, topographic, and edaphic situations. Two variables must be considered in varying buffer width - slope and disease impact. Where disease impact is low, it is often difficult to detect and interpret symptoms of the disease and the risk of incipient disease is greatest in this situation. The following table sets out the downslope buffer width under different slopes and impact situations.

DOWNSLOPE BUFFER WIDTH (m)

SLOPE (DEGREES)	LOW	MOD	HIGH
0 5 10 15 20	50m	50m	40m
0 5 10 15 20	50m	40m	30m
0 5 10 15 20	40m	30m	20m
0 5 10 15 20	30m	20m	20m

IMPACT (CURRENT)

Buffer zones on the uphill side of infections should not be less than 20m and increased to 30m in situations where the uphill gradient is small and disease impact is low. Buffers should not cross over a drainage line (ridgeline or gully).

Demarcation should preferably be done by officers of the dieback mapping group working in liaison with Operations staff. Where there is competition for the available staff time, it is the responsibility of the Regional OIC (I & P) to make a decision on the use of interpreters in a particular operation. In making the decision the OIC will take into account :

(i) the complexity of the operation,

(ii) the priority of other items on the works programme;

(iii) the availability of trained interpreters on the staff of the district concerned.

5. RISK CATEGORIES

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

It is necessary to firstly determine if the different risk categories need to be separated and then the most efficient method of demarcation.

The attached Table shows when adjoining risk categories require separation. For example, a moist soil coupe contains the following risk categories:- Dieback, NEQ and Low Potential Risk. With the Dieback adjoining the NEQ and LPR, and the LPR adjoining the NEQ category. From the table Dieback (row 2) must be separated from both LPR and NEQ (columns 4 and 7 respectively). Similary NEQ (row 7) and LPR (column 4) must be separated under moist soil conditions.

Where it is necessary to separate risk categories interpreters and district staff should be involved in all demarcation. The level of involvement will depend on the complexity of the area and the expertise of district staff. The most efficient method of demarcation is to use coupe or sub coupe boundaries. In the example above fallers block boundaries can be used rather than an additional blaze or tape line.

6. PREDICTED IMPACT CATEGORIES (DIEBACK HAZARD CLASSES)

Predicted impact (dieback hazard) is to be determined by trained staff (i.e. interpreters, research, experienced district staff). Where it is necessary to separate operations in various impact (hazard) classes (as identified by the 7-Way Test) the demarcation is to be carried out by district staff only under interpreter/research supervision or after training by the interpreters/research.

Coupe or sub coupe boundaries are the most efficient method of demarcation.

7. These guidelines give the minimum level of demarcation which is required. In many cases however these lines can be integrated with other management lines such as faller's block, or subcoupe boundaries.

(Reference:
"Environmental Guidelines - Dieback No. 1, 23.5.86, updated August 1987).

...ION OF BOUNDARIES BETWEEN RISK CATEGORIES IN THE JARRAH FOREST

ADJOINING RISK CATEGORY

RISK CATEGORY	Secure Dieback Free	Dieback	Suspect	L.P.R.	H.P.R.	Uninter-pretable	N.E.Q.
Secure Dieback Free		Yes (All Ops)	Yes (All Ops)	Yes (moist soil and old maps) No (new maps or dry soil)	Yes (All Ops)	Yes (All Ops)	Yes (All Ops)
Dieback	Yes (All Ops)		Yes (All Ops)	Yes (moist soil) No (dry soil)	Yes (All Ops)	Yes (All Ops)	Yes (All Ops)
Suspect	Yes (All Ops)	Yes (All Ops)		Yes (All Ops)	Yes (All Ops)	Yes (All Ops)	Yes (All Ops)
Low Potential Risk	Yes (moist soil & old maps) No (new maps or dry soil)	Yes (All Ops)	Yes (All Ops)		Yes (All Ops)	Yes (LPR not below uninterp No (LPR below uninterp)	yes (moist soil or old maps) No (new maps, dry soil LPR below N.E.Q.
High Potential Risk	Yes (All Ops)	Yes (moist soil) No dry soil)	Yes (All Ops)	Yes (All Ops)		Yes (All Ops)	Yes (All Ops)
Uninterpretable	Yes (All Ops)	Yes (All Ops)	Yes (All Ops)	Yes (LPR not below uninterp) No (LPR below uninterp.)	Yes (All Ops)		Yes (All Ops)
N.E.Q.	Yes (All Ops)	Yes (All Ops)	Yes (All Ops)	Yes (moist soil or old maps) No (new maps, dry soil LPR below N.E.Q.)	Yes (All Ops)	Yes (All Ops)	

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.2 PROTECTION OF SOIL (INCLUDING REHABILITATION MEASURES)

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 by skidding operations in wet soil conditions.

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

(a) survey the faller'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 faller'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 CLM 108), and calculate percentage of damaged soil.

If the total area of soil damage, including the landing, is greater than 10% then skidding in that fallers block must cease immediately. The logging operator 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 an example of a completed "Field Assessment of Soil Damage" sheet, with accompanying plot of faller's block.

1.4 In clearfelling situations (i.e. karri forest) the acceptable limits of soil damage are 5% with respect to landings and 20% overall. In clearfelling situations where a "partial cut" 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 faller'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 Industry by the logging operator by the following first day of March, 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 operator 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 Industry personnel 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) Inteceptor 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:
40cm high and 40cm thick, using soil or logging debris

(c) Angle of interceptor banks:
60° to flow of water

(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. Water must not be diverted into another drainage line. Water must not be diverted into dieback free forest.

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 in fully integrated logging operations must be rehabilitated by the logging operator to the satisfaction of the FOIC. In jarrah forest, landings should be rehabilitated in conjunction with the completion of loading out. Elsewhere, rehabilitation must be completed by the first day of May following the completion of logging. Logging is deemed to be complete when the sub-coupe, including landings, has been certified complete by an authorised certifying officer.

3.2 In areas where logging is carried out concurrently by more than one logging operator, the task of rehabilitation of landings must be shared by the different logging operators 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 operator, the task of rehabilitation of landings must be completed by each logging operator 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, and

(b) in clearfelled areas, the ripping of any damaged soil to a depth of 500mm at a spacing of 1 metre, parallel to the natural contour of the land, or

(c) in thinned areas the levelling and raking of any damaged soil, again parallel to the natural contour of the land.

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, seeding or planting considered necessary will be carried out by the relevant CALM District during the winter following rehabilitation.

1 November 1987

FIELD ASSESSMENT OF SOIL DAMAGE

DISTRICT ..... Harvey ..... FALLERS BLOCK ..... No 1 .....
BLOCK/CPT..... Ross 2 ..... INDUSTRY DETAILS ..... R. N Palmer .....
COUPE ..... 3 .....
CUTTING PRESCRIPTION ..... Selection cut for J sawlog, poles, bridge timbers and mining timbers .....
PLOT OF FALLERS BLOCK (ATTACHED)

SURVEY SUMMARY

1) Total area of faller's block 15675 m^2
2) Area of landing 900 m^2 (5.7%)
3) Skidding damage:

Line	Damaged	Undamaged	Total
1	14	80	94
2	17	85	102
3	19	86	105
4	10	77	87
Total	60 (a)	328 (b)	388 (c)

Skidding damage = $\frac{(a)}{(c)}$ x 100 = ... 15.5 .....%

4) Total damage = 2) + 3) = ... 21.2 .....%.

RECOMMENDATION

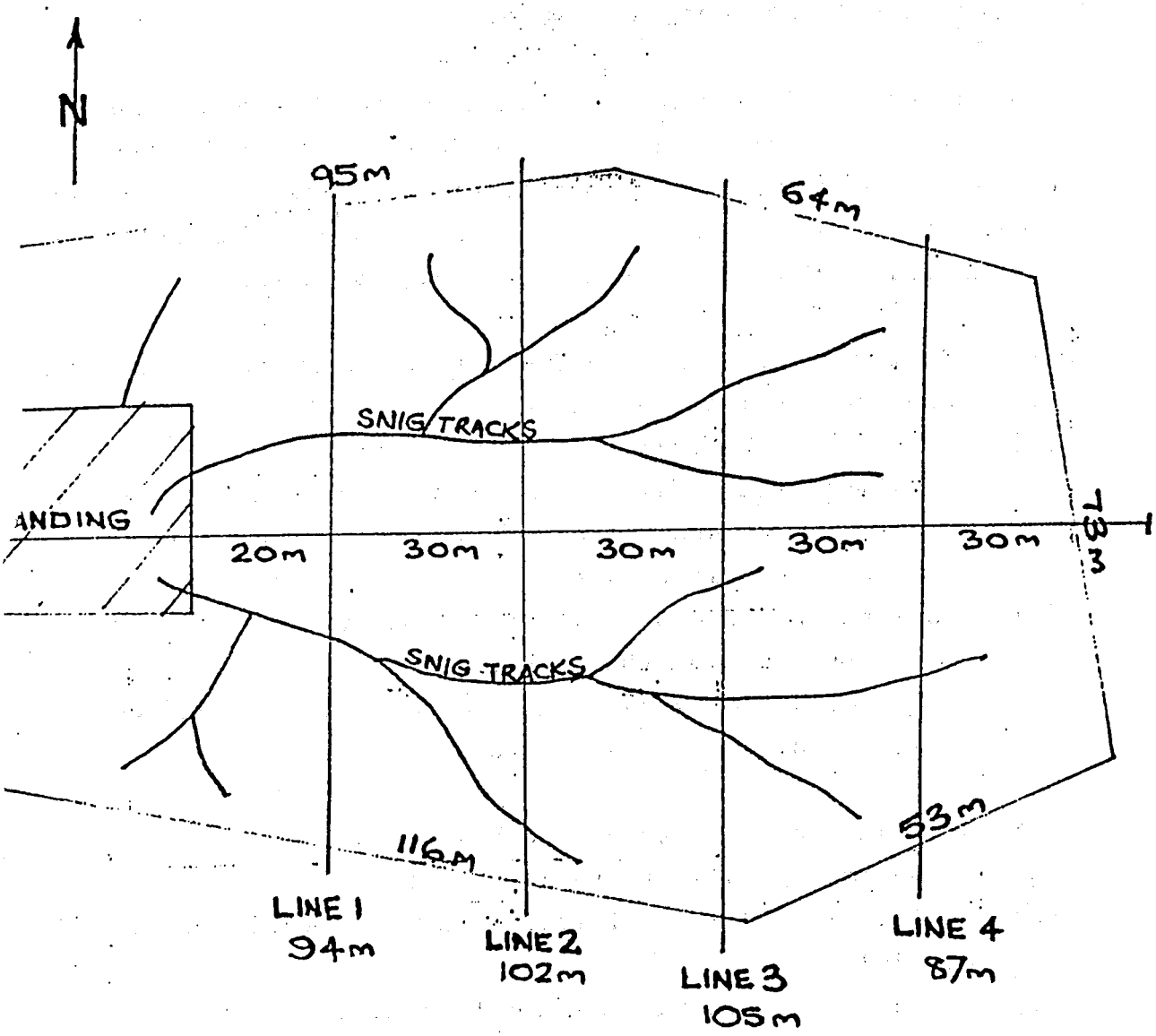
1. Operation can continue; survey to be repeated .....
(Nominate when)

✓ 2. Fallers block closed.

Date of assessment - ..... 1.8.87 .....
Officer compiling - ..... F/R Smith .....

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

OCATION PLAN



SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.3 PROTECTION OF WATER

1. Many catchments in the Northern Jarrah 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 in the NJF.

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 (specifications 1.1 and 1.3)
   (b) road construction and maintenance (specifications 2.2 and 2.3)
   (c) gravel pit working and rehabilitation (specification 2.4)
   (d) coupe demarcation (specification 4.1)
   (e) extraction (specification 4.3)
   (f) haulage (specification 4.4)
   (g) protection of soil (specification 5.2)

   CALM staff and industry personnel must be totally familiar with the requirements for protection of water as detailed in the above specifications.

4. No roading or logging may take place within 500m of the high water mark of any reservoir without prior notification of the relevant Water Authority.

SECTION 5 - ENVIRONMENTAL PROTECTION

SPECIFICATION 5.4 PROTECTION OF CROP TREES

1. In coupes where crop trees are marked for retention, Industry personnel must make every effort during all phases of logging to protect the 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. The sample should consist of at least three 10m wide assessment lines <u>across</u> the faller's block or sub-coupe as illustrated in attachment 5.4.2. The results should be written on the CLM Form 107 (Attachment 5.4.1).

3. If more than 5% of trees assessed are damaged, then the Industry may be charged for <u>all</u> damaged trees in that faller's block at rates determined by the Executive Director.

4. Copies of all crop tree damage assessments must be handed immediately to the relevant District Manager. Copies must be forwarded to the Manager of the relevant logging operator, and the relevant Industry Bush Boss.

5. As well as avoiding physical damage, Industry 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. Industry Bush Bosses should encourage fallers and skidder drivers to carry out tops disposal during the course of a logging operation.

1 November 1987

Attachment 5.4.1
CLM 107 (1987)

FIELD ASSESSMENT OF CROP TREE DAMAGE

DISTRICT ..... FALLERS BLOCK .....

BLOCK ..... INDUSTRY DETAILS .....

COUPE ....

SUB COUPE..... .....

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

.....

.....

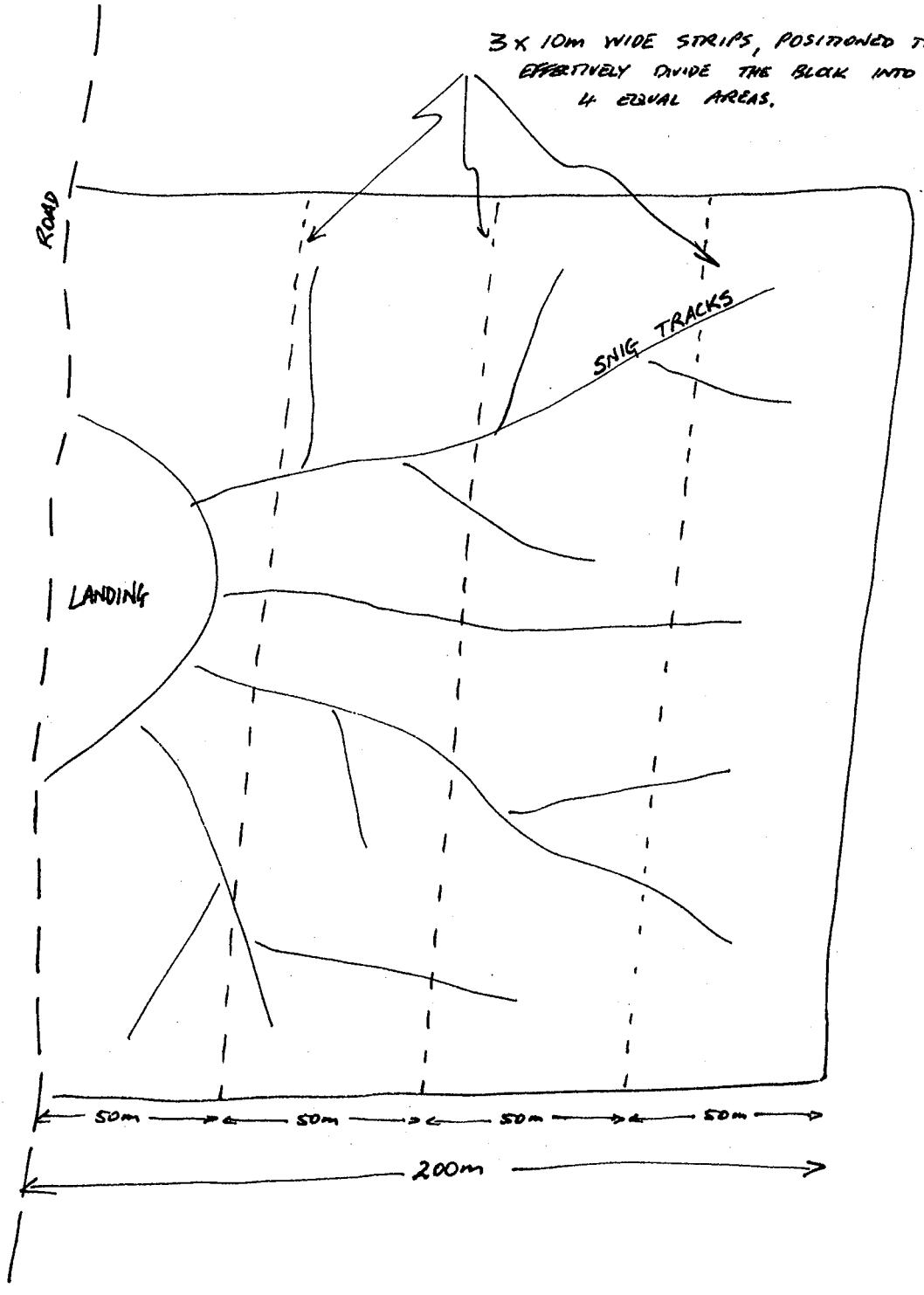
.....

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 "Industry Details" specify name of company, type of machinery involved and names of faller and skidder driver.
3. In "Comments" write down:
   (i) any environmental or other factors, if any, that may have affected the result of the assessment and
   (ii) whether this assessment has indicated an improvement or worsening of performance by the Industry.
4. If, in "Recommendations" it is recommended that the Industry be charged for crop tree damage, the total number of crop trees in the faller's block must be assessed and the total number of damaged crop trees determined.
5. Forward this form immediately to District Manager; copies to Industry Bush Boss and Manager of Logging Company.

PLAN ILLUSTRATING METHOD OF ASSESSING CROP TREE DAMAGE



SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENT

SPECIFICATION 6.1 GENERAL DESCRIPTION AND SPECIFICATIONS OF LOG PRODUCT TYPES

1. Definitions

A complete list of currently recognised log product types may be found in Appendix 2 of the Hardwood Logging Computer System 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 by a sawmiller to be merchantable, that is, worth cutting into products, may be classed as a sawlog. For commercial purposes however, ten types of sawlogs are recognised:

1.1.1 First Grade sawlogs (formerly General Purpose Sawlogs) - this is the most common type of sawlog cut and includes all sawlogs supplied to all Head Office licensed sawmills, (or "G.P. Sawmills") that is sawmills that are guaranteed a specific volume of sawlogs each year by the State Government. The minimum length and minimun crown diameter under bark of a First Grade Sawlog is generally 2.1m and 250mm respectively, and the minimum amount of millable wood in such a log is generally set at 50% as assessed on the worst end.

1.1.2 Second Grade Sawlogs (formerly Salvage sawlogs) - these are sawlogs below the standard of First Grade sawlogs, but considered merchantable by a registered sawmiller. Most second grade sawlogs are produced during or after cutting by, or for, H.O. licensed sawmills. 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.

1.1.3 Premium Grade Sawlogs - these are high quality sawlogs that may be sold for specific end uses.

1.1.4 Short Sawlogs - these are sawlogs, of a specific quality, and below a specific length, that may be sold for specific end uses.

1.1.5 Reject Sawlogs - These are sawlogs, below normal Second Grade Sawlog quality, that may be sold by the Department at special royalty rates.

1.1.6 Medium Old Growth Sawlogs - these are sawlogs, of minimum length 2.1m, and between 200mm and 300mm crown diameter under bark, cut from old or non-growth forest.

1.1.7 Small Old Growth Sawlogs - these are sawlogs below 200mm crown diameter under bark, cut from old, or non-regrowth forest.

1.1.8 Large Regrowth Sawlogs - these are sawlogs, of minimum length 2.1m and minimum crown diameter under bark of 300mm, cut from regrowth forest.

1.1.9 Medium Regrowth Sawlogs - these are sawlogs, of minimum length 2.1m, and between 200mm and 300mm crown diameter under bark, cut from regrowth forest.

1.1.10 Small Regrowth Sawlogs - these are sawlogs, of minimum length 2.1m, and crown diameter under bark less than 200mm, cut from regrowth forest.

1.2 Veneer Logs:

Veneer or peeler logs are logs intended for slicing or peeling into sheets for the production of veneer or plywood. The minimum length and minimum crown diameter under bark for veneer logs is generally 2.6m and 450mm respectively. Veneer logs must be of a consistently high quality, with much less allowable defect than sawlogs.

1.3 Bridge and Jetty Timbers

Bridge and Jetty Timbers are logs intended for use in the construction of bridges, wharves and jetties. Like Veneer Logs, Bridge and Jetty Timbers must have 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.

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 similar high quality. Most poles are produced for use by the State Energy Commission 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.

1.5 Chip Logs

Chiplogs are logs for conversion into woodchips at the W.A. Chip and Pulp Company, Manjimup.

1.6 Mining Timbers

Mining Timbers are generally short, straight lengths of jarrah log, of crown diameter under bark between 125 and 250mm, used to support underground coal mines at Collie. Three terms commonly used are:

1.6.1 Props

These are short lengths, say 2.4 or 2.7m, used in an upright position in direct contact with the roof of a mine.

1.6.2 Legs

These are similar to props, but are used to support Bars.

1.6.3 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 Minor Forest Produce

Minor Forest Produce is a general term used to describe all products other than the products listed above. In most cases the individual piece size, and total volume per unit area, of Minor Forest Produce is small. Specification 6.11 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 products listed above is a task that requires considerable knowledge, experience and judgement. Below is a list of common log defects:-

2.1 Pinholes - these are small holes approximately 1.0mm in diameter, caused by a beetle known as the Pinhole borer (Atractorcenis kreuslerae). Pinholes are easily visible on the surface of a log. The depth of pinholes can only be assessed by inspecting the ends of a log.

2.2 Dry Side - a dry side is a dead section of a log, usually extending for several metres and usually affecting from one third to one-half of the circumference of a log. A dry side is usually caused by wildfire.

2.3 Shake - This is a separation between adjoining layers of wood due to causes other than drying. Shake parallel to growth rings is commonly known as ring shake.

2.4 Shatter - This is the term used to describe the facture of a log resulting from falling.

2.5 Rot - Rot is the decay of timber due to fungal attack. Such fungi are of two types:

(i) Primary Attacking Fungi (parasitic fungi) which survive in growing trees, and

(ii) Secondary Attacking Fungi (saprophytic fungi) which survive in dead timber.

The two most common and significant types of rot are both caused by parasitic fungi:

(i) Heart or Column Rot - results in a column of rot in the centre of the bole of a tree extending from the point of infection and

(ii) Jarrah Straw Rot - results in decayed wood that resembles straw.

2.6 Gum - is liquid exudate of trees, commonly resulting from injury. Gum can collect in pockets, rings or veins. Gum is the major defect in Marri (Eucalyptus calophylla).

2.7 Wind - this is the term used to describe non-straight grain in a log or tree; also known as cross-grain or spiral grain.

2.8 Split - this is a lengthwise separation of wood fibres extending through a log from one surface to another. Splitting at the ends of logs (end splits) is a common defect in young, fast grown logs.

2.9 Heart - this is the central portion of a log consisting of unstable and/or decaying wood. In all hardwood sawlogs the heartwood must be sawn out ("boxed out"). The size of the heart varies but often comprises up to 20% of a log.

2.10 Double Heart - the ends of some logs may display two hearts or "double heart". Double heart represents the growth of branches in trees. The existence of double heart reduces the amount of millable wood in a log.

2.11 Check - This is a separation of fibres along the grain forming a fissure, but not extending through a log. Checks form as a log dries.

2.12 Knots - knots are unstable areas of wood corresponding to the junction of the main trunk of a tree and a branch. A knot that is relatively tight, solid and free from decay is known as a "sound knot", otherwise it is referred to as a "loose knot". A "knot hole" results when the wood in a knot is removed.

2.13 Bend - Bends in a log affect:

(i) the strength of a round piece of timber or

(ii) the percentage recovery of a sawlog. Bend in a log is referred to as

(i) Sweep - a gradual bend in one direction; or

(ii) Multiple Sweep - gradual bends in more than one direction; or

(iii) Crooks or kinks - one or more sudden or sharp bends.

2.14 Sapwood - This is the outer layer of the wood of a tree which at the time of felling contains living cells and reserve materials such as starch. Sapwood represents the non-durable portion of hardwood timber.

2.15 Butt Spurs - These are irregular growths near the base of a tree, providing strength in the support function of the truck. A more uniform increase in size of a trunk near ground level is known as "buttswell".

2.16 Pith - Pith is a term used to describe the soft, generally decaying centre or heart section of a log.

For a complete glossary of all terms used to describe timber, refer to the booklet: "Terms Used in Timber Standards", Australian Standard 01 - 1964, published by the Standards Association of Australia.

The acceptable size or extent of each type of log defect varies depending on the log product in question. The detailed specifications for each log product are listed in Specifications 6.2 to 6.11 inclusive in this Manual.

3. Log Treatment

3.1 Log Treatment is the process of applying sawcuts to a log to prepare it for measurement, prior to the log leaving the bush. Terms used in log treatment are:-

3.1.1 Long butting - immediately after felling, the cutting off of one or more short lengths from the butt end of a tree to remove obvious defect.

3.1.2 Crown cutting - after felling, the cutting off of the crown or top of a tree. In the absence of log defect, the crown cut must correspond to the minimum crown diameter specifications for the desired log product.

3.1.3 Queen cutting - the application of two cuts to a log to remove a section of log, usually containing defect.

3.1.4 Docking - the cutting off of one of more short lengths of log, usually at a landing,to remove defect.

3.1.5 Trimming - the removal of branches, epicormics and other growths from the side of a log.

3.2 The extent or amount of treatment permitted on a particular log depends on:

(a) the priorities for production of the varous log products, and

(b) the minimum specification for the particular type of log product being sought.

In an integrated logging operation, that is in an operation where most or all log products are extracted to the same landings at the same time, then the Forest Officer in Charge has the ultimate responsibility of deciding the extent or amount of log treatment. This requires a clear understanding of log product priorities, product specifications and the Department's "In Forest Log Treatment" Policy.

3.2.1 Log Product Priorities

The priorities for production of the various log products are set by Timber Production Branch, and relayed to FOIC's via the relevant Regional staff. Normally the priorities are:-

1. Veneer or Peeler logs
2. Bridge and jetty timbers
3. S.E.C. poles.
4. First Grade Sawlogs
5. Second Grade Sawlogs

3.2.2 In-Forest Log Treatment

Attachment 6.1.1 is a copy of the "In-Forest Log Treatment" policy. This policy applies to integrated logging operations producing both First Grade Sawlogs and Second Grade Sawlogs. The aim of the policy is to ensure that (a) total utilisation of sawlogs is maximised, and (b) the quality of (i) First Grade sawlog and (ii) Second Grade sawlog is maintained. This is not an easy task and all FOIC's must work hard at applying the rules fairly and consistently.

1 November 1987

IN-FOREST LOG TREATMENT - POLICY

Current from 1 October 1987

BACKGROUND

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

However, in a typical integrated logging operation, an average of five different log product types are harvested:

1. First grade sawlogs (GP Sawlogs)
2. Second grade sawlogs (salvage sawlogs)
3. Chiplogs
4. Bridge timber
5. Poles

In the jarrah forest at least, further log product types will be produced in large quantities:

1. Charcoal logs
2. Domestic firewood logs
3. Minor forest products

It is therefore becoming increasingly important for CALM staff supervising logging operations to have a sound understanding of:

1. The specifications of the various log products. For details of the specification of each log product please refer to the Manual of Hardwood Logging Specifications.
2. The relative priorities for production of the different log products. The priority is based on the relative value of each product (unless otherwise advised, the priorities are, in descending order, bridge timbers and poles, first grade sawlogs, second grade sawlogs, minor forest produce and firewood).

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

This policy addresses point 3.

POLICY

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

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

   (ii) 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 buyer's licence or contract of sale, or

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

2. 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 <u>not</u> 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.

3. 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.

4. 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 operator wishes to dock a log. Rather, the FOIC must ensure the logging operator'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.

5. On the bush landing docking will be minimised, in an attempt to:

(i) maintain a greater average sawlog length,
(ii) reduce the volume of docked waste at log landings.

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

6.1 For logs less than 4.5 metres in length:

(i) 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).
(ii) 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.
(iii) If it is considered that more than 0.6m needs to be docked to produce a first grade sawlog, consider docking either 2.1 or 2.4m to produce a short first grade log and a short second grade log.
(iv) If the demand for short logs (2.1m and 2.4m) is low, and docking of 0.6m from one end is unlikely to produce a first grade sawlog, sell the whole log as a second grade sawlog.

6.2 For logs greater than 4.5 metres in length:

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

(ii) 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.

(iii) 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 2.1m or 2.4m to produce a short second grade sawlog and a longer first grade sawlog, or vice versa.

(iv) If, by docking a minimum length of 2.1m or 2.4m, a minimum quality second grade log is likely to be produced, consider selling the whole log as a second grade log.

7. 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 log product, thereby replacing the 30% millable specification listed above.

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

SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.2 FIRST GRADE SAWLOGS

1. Specifications:

(i) Minimum length - 2.1m

(ii) Minimum crown diameter under bark - 250mm

(iii) Amount of millable wood on worst end - 50%, as assessed by the FOIC

add "minimum dimensions for karri are length 2.4m or 2.7m, diameter 300mm"

2. Measurement

First Grade Sawlogs may be measured in two ways:

(i) True volume under bark measured on individual logs, or

(ii) Application of the appropriate weight-volume conversion factor.

The method of measuring individual logs is detailed in the C.A.L.M. booklet: "Cubic Contents of Hardwood Logs", 1985.

1 November 1987

SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.3 SECOND GRADE SAWLOGS

1. Specifications:

(i) Minimum length - 2.1m

(ii) Minimum crown diameter under bark - 250mm

(iii) Amount of millable wood on worst end - 30%, as assessed by the FOIC

2. Measurement

Second Grade Sawlogs may be measured in two ways:

(i) True volume under bark measured on individual logs, or

(ii) Application of the appropriate weight-volume conversion factor.

The method of measuring individual logs is detailed in the C.A.L.M. booklet: "Cubic Contents of Hardwood Logs", 1985.

1 November 1987

SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.4 VENEER LOGS

1. Specifications:

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 - provided that the log diameter is 440mm or greater a pipe up to 150mm in diameter is permissable so long as the pipe is straight and central in log and that there is sufficent sound wood around the pipe to hold a 210mm chuck.

(f) Borers, Pinholes - not permissable.

(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.

2. Measurement

Veneer logs may be measured in two ways:

(i) True volume under bark measured on individual logs, or

(ii) Application of the appropriate weight-volume conversion factor.

The method of measuring individual logs is detailed in the CALM booklet: "Cubic Contents of Hardwood Logs", 1985.

1 November 1987

SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.5 BRIDGE TIMBERS

1. **Specifications:**

   All Bridge Timbers prepared for sale to the Main Roads Department of W.A. must conform to the following specification:-

   "M.R.D. Specification for Supply of Untreated Round Timber" (May 1986) for untreated jarrah bridge timbers. Timber production staff must be familiar with this document.

   Bridge Timbers prepared for other orders may vary in specification depending on the requirements of the customer. Species other than jarrah may be used. All bridge timbers must be inspected and appropriately marked by a C.A.L.M. round timber inspector prior to sale.

2. **Measurement**

   Bridge timbers are measured by recording

   (i) length rounded down to the nearest 0.1m and

   (ii) crown diameter under bark rounded down to the nearest cm.

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SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.6 POLES

1. Specifications:

1.1 S.E.C. Poles

Poles prepared for sale to the State Energy Commission of W.A. (S.E.C. poles) are classified according to: (i) length and (ii) strength. Nominated lengths increase in 1.5m increments from a minimum of 9.5m to a maximum of 20.0m. Strengths are specified in kiloNewtons and vary from a minimum of 2 to a maximum of 10, depending on diameter. All poles prepared for sale to the S.E.C. are inspected by a qualified C.A.L.M. round timber inspector. Only those poles passed, and identified by the inspector's brand and by the appropriate aluminium identification disc, may be sold to the S.E.C. The specifications for S.E.C. poles are detailed in the following two documents:

1.1.1 S.E.C. of W.A. Specification No ES/39/86 for jarrah poles for use without full length preservative treatment (1987 revision).

1.2.1 S.E.C. of W.A. Specification No. ES/37/86 for jarrah, marri and blackbutt poles for use after full length preservative treatment. (1987 revision)

Timber production staff must be familiar with these documents.

1.2 Other Poles

Poles, other than for sale to the S.E.C. may be prepared. There is no written specification for "other poles" because of the varying end use and hence standards of such poles. "Other poles" may be produced to any nominated length or diameter.

2. Measurement

2.1 S.E.C. Poles

S.E.C. poles are measured by individual tally of poles in each length class.

2.2 Other Poles

"Other Poles" are measured by recording:

(i) length rounded down to the nearest 0.1m and

(ii) crown diameter under bark rounded down to the nearest cm.

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SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.7 MINING TIMBERS

1. Specifications:

All timber supplied must comply with the Coal Mines Regulations Act 1946-76, Reg 70 (2)(b) and (c) which state:

(b) "Timber from which the bark has not been removed shall not be sent into the mine for any purpose.

(c) For the purpose of this regulation, timber which has a short grain shall not be suitable and on no account shall black butt be used as roof or side supports, nor shall red gum be used, except in the round for temporary props in pillar extraction.

Species

All timber supplied must be jarrah unless specific approval is obtained from the Superintendent of Underground Operations, WCL.

Size

Diameter

All timber supplied will be within the nominal crown diameter under bark sizes ~~100~~, 125, 150 or 200mm. The allowable variation on each size is as follows:-

~~100mm~~	~~-12mm or +25mm~~
125mm	-12mm or +25mm
150mm	-12mm or +50mm
200mm	-12mm or +50mm

Crown size will be specified according to length and purpose of material ordered.

N.B. Any variation in the nominal crown sizes specified will be the result of a special order from WCL.

Length

All timber supplied will be within nominal lengths commencing at 1.8m and increasing in odd increments to a maximum of 6.0m. Lengths outside this range will be supplied by special order from WCL. Lengths will be supplied with ends sawn square. No under-length is accepted but up to 100m overlength will be accepted.

Quality

All timber supplied must be green, that is, recently felled, and free from any bark, rot, cracks, splits or knots as far as practicable.

All timber supplied must be reasonably straight and must not deviate by more than half the crown diameter throughout the length of the prop, leg or bar.

Double heart will be accepted in the crown end provided heart centres are not separated by more than 33% of the diameter.

Insect and mechanical damage is acceptable provided it is confined to the sapwood.

Limbs, knots and branch stubs, must be trimmed flush with the sapwood surface. They must be sound and tight and not exceed 20% of the piece circumference measured immediately above the knot.

Tight gum rings are acceptable. Included sapwood and gum pockets must not exceed 12mm in radius, or 100mm in circumference.

To allow man-handling the surface of all timber supplied must be reasonably smooth and free of splinters.

2. Measurement

Mining timbers are measured by recording:-

(i) length rounded down to the nearest 0.1m and

(ii) crown diameter under bark rounded down to the nearest cm.

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SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.8 CHIPLOGS

1. Specifications: *

1.1 Dimension

1.1.1 Karri (old growth)

Minimum small end diameter under bark will be 150mm. The minimum length will be 2.1m.

1.1.2 Marri (old growth)

Minimum small end diameter under bark will be 230mm. The minimum length will be 2.1m.

1.2 Defects

The following log 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 log 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% acceptable in logs under 900mm in diameter.

Debarked logs mean logs with 99% of the bark removed.

* Note, this specification may vary for specific Contracts.

2. Measurement

Chip logs supplied to W.A. Chip and Pulp Company are measured by weight with subsequent conversion to true volume under bark using the appropriate weight/volume conversion factor. Conversion factors are listed in Appendix 9 of the Hardwood Logging Computer System User Manual.

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SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.9 CHARCOAL LOGS

1. Specifications:

Species - jarrah bark on or bark off.

Moisture content - any moisture content, i.e. "green" or "dry".

Dimensions - Diameter: minimum underbark - 150mm
maximum underbark - 1200mm
Length: minimum - 1.8m
maximum - unlimited

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 minimum 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

2. Measurement

Charcoal logs are measured by weight on customer's weighbridge.

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SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.10 "FURNACE" LOGS FOR SILICON PROJECT

1. Specifications

Species - jarrah, bark on or bark off.

Moisture content - minimum 60%, ie logs must be freshly cut or "green".

Dimensions - Diameter: minimum underbark - 100mm
maximum underbark - 300mm
Length: minimum - 1.8m
maximum - unlimited

Log Preparation - Lateral projections (branches, limbs, bumps) not to exceed 100mm.

Ends must be cut roughly square.

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 - up to a maximum of 10% of log volume
- gum in any form
- bends - up to a minimum 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:

. shattered wood

2. Measurement

"Furnace" logs are measured by weight on customer's weighbridge.

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SECTION 6 - LOG SPECIFICATIONS AND MEASUREMENTS

SPECIFICATION 6.11 MINOR FOREST PRODUCTS

The following list of minor forest products may be sold under pre-paid local Minor Forest Produce licences, using the appropriate, up-to-date royalty:-

1. **Sheoak and other Speciality Timbers**

   Sheoak timber (Allocasuarina fraseriana) may be sold to authorised sheoak mills (that is, authorised by Timber Production Branch S.O.H.Q.). Sheoak timber may be sold "in the square", that is, by the volume of sawn timber produced, or "in the round".

   Other "Speciality Timbers" may also be sold, measured in the square or in the round. These "Speciality Timbers" include "Curly" jarrah, Karri Oak, River Banksia, Bull Banksia, Peppermint, and Warren River Cedar.

   In addition to the above methods of measurement and sale, timber for use by craftspersons may be collected, from the forest floor only, after payment of a "Craft Wood" licence.

2. **Firewood**

   Any dry or near dry timber lying on the ground may be sold as firewood. Standing dead trees may be cut for firewood also, however local CALM staff must satisfy themselves that firewood licensees do not cut trees that may contain millable timber. Jarrah is considered the best firewood species. Firewood is sold by the tonne, and must be cut into short (less than 0.5 metre) lengths prior to removal from the forest. Members of the public may obtain small quantities of firewood for their own use without any special written authority. Only ground salvage material however may be obtained. If firewood is sold in log form, the following specification shall apply:-

Species: Jarrah, Wandoo, Sheoak, Banksia, bark on or bark off

Moisture Content: Any moisture content: i.e. "green" or "dry"

Dimensions: Diameter: Minimum SEUB: 150mm
Maximum underbark: unlimited

Length: Minimum: 1.8m
Maximum: unlimited

Log preparation:

- Ends of logs must be cut roughly square, and must consist of at least 50% by area of solid wood in one continuous piece.
- Projections from the surface of a log, for example limbs, must be no greater than 100mm.

Unacceptable defects:

- Rotten wood, if the proportion by volume is greater than 25%, as assessed on the worst end face.
- Shattered wood.
- Bends greater than 150mm in any 3m length.
- Soil or grit embedded on the surface of a log.
- Double heart or spiral grain likely to hinder manual splitting.

3. Chopping Logs

Chopping logs are short lengths (about 65cm) of jarrah, karri or pine, used in the sport of log chopping. Chopping logs are sold individually.

4. Fencing Timber

Fencing timbers include:

(i) posts (either in the round or split)

(ii) Strainers and

(iii) Struts

All fencing timbers are measured in length (to the nearest 0.1m) and crown diameter under bark (to the nearest cm). For split posts, an average crown diameter must be estimated.

5. Garden Paving Slabs and Rings

These are rings, about 7.5cm thick, cut from logs about 40cm in diameter. They are sold individually.

6. Burls

Burls are dense outgrowths on the sides of trees. It is thought that they result from a tree's reaction to attack from insects or viruses. Burls may be cut from felled trees only. They are sold individually, according to diameter as measured on the cut face.

7. Hollow Logs

Hollow logs are used for landscaping and in aviaries. Only logs that may be handled manually are sold as hollow logs. They are sold individually.

8. Blackboy Stumps

Blackboy stumps are used in the woodcraft industry. Only dead blackboys may be used. Blackboy stumps are sold individually.

9. Bean Sticks

These are the long thin stems of various species of Melaleuca or Leptospermum (commonly known as "T-Tree"). The cut stems are used as plant supports in the market garden industry. Bean sticks are sold by the 100.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.1 SAWMILLING LICENCES

1. Four different types of licence are used to authorise the sawmilling of logs ex State Forest:-

   (i) Forest Produce (Sawmilling) Licence, issued by S.O.H.Q. (commonly known as a "Head Office Licence")
   (ii) Forest Produce (Sawmilling) Licence, issued by Districts (a "Local Licence")
   (iii) Minor Forest Produce Licence, issued by Districts (a "pre paid Local Licence") and
   (iv) Contract of Sale, issued by S.O.H.Q.

   (A Forest Produce (Chipwood) Licence is issued by S.O.H.Q. to authorize the cutting of chip logs ex State Forest).

2. The F.P.(S).L, issued by SOHQ, authorizes a sawmill to cut a specified volume of logs from specified areas of State Forest for a 12 month period commencing on either 1 January, 1 July or 1 November. Payment by the Licensee is made after the logs are delivered to the sawmill. However, the sawmill owner must lodge a cash deposit or bank guarantee with the Department prior to the commencement of cutting.

3. The locally issued FP(S)L (form CLM 458) may only be issued for periods up to a maximum of three months, authorizing certain sawmills nominated by SOHQ to cut a specified volume of logs from specified areas of State Forest. Payment is again made after the logs are delivered, provided a cash deposit or bank guarantee is lodged in advance.

4. The Minor Forest Produce Licence (form CLM 165) may be used to sell small quantities of second grade sawlog to a sawmill, or to sell second grade sawlog to an authorized "salvage logging operator". All products sold under a M.F.P.L. must be paid for in advance.

5. The Contract of Sale is used by SOHQ when selling any type of log produce produced by a CALM logging contractor. Again, the customer is required to lodge a cash deposit or bank guarantee with the Department before being allowed to receive logs on the standard 30 days credit.

6. Renewal of SOHQ-issued FP(S)L

The SOHQ-issued FP(S)L holder must apply to renew his licence each year on a form CLM 49A. This form is sent by SOHQ to each licence holder approximately two months prior to expiry of the licence. The licence holder then forwards the signed application to the relevant District Manager. The District Manager must then sign the 49A after making comment on the operation of the licence over the previous 12 months. The completed 49A is then sent to SOHQ via the relevant Regional office.

The District Manager must forward, with the 49A, three copies of completed form CLM49B. The 49B is a plan of all areas proposed for cutting in the next 12 months. The plans must be drawn at scale 1:50,000, and should correspond to the appropriate One (or Two) Year Logging Plan. The 49B plans must be approved at the Regional Office, the originals forwarded to the licence holder, and a copy forwarded to SOHQ.

7. If, during a cutting year, it becomes necessary to cut areas not covered by a 49B, then a 49B must be prepared and processed as outlined in 6 above.

8. At the time a licence holder is asked to apply to renew his licence, he is invited to complete a form CLM 818 which is an "Application for permission to stockpile sawlogs and for deferment of royalty thereon". This application is to allow cutting in the bush at above average daily volumes to build stockpiles for winter milling and if required defer royalty payment on the stockpile by averaging to a fixed monthly dollar amount.

9. Mill Returns

All FP(S)L holders are required to furnish, to the CALM District Office, a monthly summary of sawmilling operations on form CLM 182. This return must be accompanied by a summary of all log deliveries made during the month on log folio sheets (form CLM 183). These sheets must list the date, number and volume for every Delivery Note applicable to that month. Upon receipt of a mill return, the District Manager must check, endorse, and forward to SOHQ.

10. Simultaneous operations on Crown lands and private property

If a FP(S)L holder, or FP(C)L holder, wishes to cut timber from private property and Crown lands simultaneously, he must apply for permission to do so by writing to the relevant Regional Manager. The letter must state the numbers of the locations over which it is desired to work, the names of the owners, P.P. 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.

If permission is given to operate simultaneously, the Regional Manager must provide the relevant District Manager with the above information, enabling District procurement staff to monitor log haulage in their District, and efficiently carry out mill landing inspections.

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SPECIFICATION 7.2 REGISTRATION OF SAWMILLS

1. Every sawmill used in the timber industry must be registered under and in accordance with the regulations made under the Timber Industry Regulation Act.

2. Applications for registration must be made on form T.I.R. 18 to S.O.H.Q. Registration is effected upon payment of the annual fee and issue of a certificate on form T.I.R. 19. Registration has effect for the year ended 31 December.

3. Detailed procedures to be followed in the registration of sawmills is set out in Part IV of the Regulations made under the T.I.R. Act.

4. Sawmill alterations
   District Managers should report to SOHQ any proposed mill alterations especially those likely to affect the annual log requirements of that mill.

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SECTION 7 - ADMINISTRATION

SPECIFICATION 7.3 CROWN LAND SAWMILLS

"Crown Land" sawmills are those that buy at least part of their annual log resource from CALM.

1. Sawmills operating under a "Head Office" FP(S)L (i.e. with guaranteed annual intakes of sawlog from State Forest).

Company	Head Office Licence No.	Location of Mill	CALM District resp. for mill land. inspection	Licence Renewal Date
1. Pickering Brook S/Mills	1649	Pickering Brook	Mundaring	31/10
2. Whittakers	1647	Welshpool	Jarrahdale	31/10
3. Millars (Bunnings)	1645	Jarrahdale	Jarrahdale	31/10
4. Ardwick (Colli)	1601	*Mundijong	Jarrahdale	31/12
5. Cardoso (Colli)	1636	*Mundijong	Jarrahdale/ Mundaring	31/10
6. Dale Timb Co (Coli)	1604	West Dale	Jarrahdale	31/12
7. Bunnings	1640	Dwellingup	Dwellingup	31/10
8. Millars (Bunnings)	1648	Yarloop	Harvey	31/10
9. Bunnings	1641	Collie	Collie	31/10
10. G. Coli	1593	Darkan	Collie	31/12
11. Whittakers	1606	Kirup	Kirup	31/10
12. Whittakers	1617/1650	Greenbushes	Kirup	31/12
13. Adelaide Timber	1651	Wilga	Kirup	31/10
14. Preston Timber Co. (Coli)	1610	Argyle	Kirup	31/10
15. Millars (Bunnings)	1646	Nannup	Nannup	31/10
16. Adelaide Timber	1652	E. Witchcliffe	Busselton	31/10
17. K.D. Power	1560	Busselton	Busselton	31/10
18. Cardoso (Colli)	1561	Busselton	Busselton	31/10
19. Monier Ltd	1626	Busselton	Busselton	31/12
20. Whiteland Milling	1642	Busselton	Busselton	31/10

cont. over

Company	Head Office Licence No.	Location of Mill	CALM District resp. for mill land. inspection	Licence Renewal Date
21.Bunnings	1637	Deanmill	Manjimup	31/12
22.Bunnings	1632	Nyamup	Manjimup	31/12
23.Millars (Bunnings)	1644	Jardee	Manjimup	31/12
24.Bunnings	1638	Pemberton	Pemberton	31/12
25.Bunnings	1639	Northcliffe	Pemberton	31/12
26.Gandy	[redacted] 1628	Jardee	~~Pemberton~~ Manjimup	31/12
27.Bunnings	1627	Walpole	Walpole	31/12
28.Panelli Sawmills	1591	Rocky Gully	Walpole	31/12
29.Bunnings	1643	Denbarker	Walpole	31/12
add "30. Wesfi 888888 Victoria Park Jarrahdale 31/12"				

* = same mill

2. Other sawmills (i.e. sawmills without guaranteed annual intakes of sawlog from State forest).

	Company	Location of Mill	CALM District responsible for mill landing inspection
1.	Hamilton Sawmills*	Osborne Park	Mundaring
2.	Jarrah Case Factory*	Bayswater	"
3.	Ashfield Sawmills*	Yokine	"
4.	Stefanelli*	Middle Swan	"
5.	Wesfi (veneer logs only)	Victoria Park	Jarrahdale
6.	Coli Timber Merchants	Gosnells	"
7.	Mandurah Sawmills (Coli)	Mandurah	Dwellingup
8.	A.H. Gordon & Sons	Boddington	"
9.	F. Muller	Wandering	"
10.	C.V. Wood	Waroona	Harvey
11.	R. Harnett	Roelands	"
12.	G.W. & N.L. Saunders	Collie	Collie
13.	S.W. Sawmill (Allen)	Waterloo	"
14.	Bunbury S/mills (Giovanetti)	Picton	Busselton
15.	Worsley Timber Co.	Margaret River	"
16.	I.P.E. Packaging (Dodd)	Cundinup	Nannup
17.	Amalgamated Timbers	Yornup	Manjimup
18.	Rijavec	Manjimup	Manjimup
19.	Middlesex Sawmills (Drake)	Manjimup	Manjimup
20.	Smithbrook Milling (Mitchell)	Manjimup	Manjimup
21.	South West Timber Supplies(Ditri)	Pemberton	Pemberton
22.	Northcliffe Timb.Co (Kershaw)	Northcliffe	Pemberton
23.	Midway Sawmills (Rudd)	Northcliffe	Pemberton
24.	J & K Sawmills (Bradbury)	Northcliffe	Pemberton
25.	McLeans	Denmark	Walpole
26.	Franey & Thompson	Albany	Albany
27.	Blackwood Timber Milling	Bridgetown	Kirup

* Members of "Small Sawmillers Association"

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SPECIFICATION 7.4 HARDWOOD LOGGING COMPUTER SYSTEM

1. The CALM Department Hardwood Logging Computer System (H.L.C.S.)is an integrated data processing and recording system for financial, operational and resource information. The system aims to cover all recording and calculation requirements for all hardwood logging operations in the Department. The system, which commenced live running in April 1986, is yet to be fully developed.

2. The system, as it involves hardwood logging operations, is described in detail in the "Hardwood Logging Computer System User Manual". This manual consists of two loose leaf folders. An individually numbered copy of this manual is held and must be carefully maintained by each District involved in hardwood logging. For an introduction to the system, refer to the staff training document produced by Timber Production Branch entitled "Commercial Logging Systems - Training Notes for CALM Staff" (Sept. 1987).

3. The key points of the system which must be clearly understood by all CALM staff involved in hardwood logging, and by the Industry, are as follows:-

   3.1 Each and every truck carting logs to Crown Land Mills, from State Forest or other Crown land controlled by the CALM Department or from private property, must carry a Hardwood Log Delivery Note Book.

   3.2 For each and every truck load of logs carted to Crown Land Mills a Hardwood Log Delivery Note (D/Note) must be completed, in as much detail as possible, before the truck leaves its point of loading.

3.3 All payments to Contractors, and all invoices to Customers, are based on information written on the original copies of the D/Notes, as summarised by the computer every half month.

3.4 D/Notes are individually numbered documents subject to audit and must be treated with care at all times.

3.5 Completed D/Notes must be collected by CALM staff as soon as possible after delivery of the logs.

3.6 At the District Office, a nominated officer, usually the OIC of the bush operation, must ensure that all D/Notes are correctly coded prior to computer input.

3.7 Following input, an officer other than the one above must check the printout of the processed D/Notes ("Input audit report").

4. H.L.C.S. Input Documents

Delivery Notes are just one of the several types of Input Documents that are used to "update" the H.L.C.S. A list of current Input Documents follows:-

CLM 823 - Hardwood Log Delivery Note, used for logs measured individually.

CLM 821 - Hardwood Log Delivery Note, used for logs measured by weight (excluding chiplogs).

CLM 759 - Chiplog Delivery Note, used for Chiplogs delivered to W.A.C.A.P.

CLM 071 - Hardwood Delivery Note, used for minor forest products and round timbers not inspected by CALM.

CLM 125C - Round Timber Inspection Certificate, used for round timbers inspected by CALM.

CLM 076 - Hardwood Log Credit Note, used for logs measured individually.

CLM 810 - Hardwood Log Credit Note, used for logs measured by weight.

CLM 100 - Hardwood Incorrect Volume Adjustment Form, used to adjust incorrect volumes or tonnages when discovered after the half monthly accounting period.

The instructions for field and office use of these Input Documents are detailed in Section D of the H.L.C.S. User Manual.

5. Distribution of Hardwood Delivery Note copies

Delivery Notes are produced in quadruplicate. It is essential that the various copies are distributed correctly. The table below shows, for different logging situations, the correct procedures regarding D/Note distribution.

DISTRIBUTION OF HARDWOOD DELIVERY NOTES

EXAMPLE / D/NOTE COPY	1. CUSTOMER DOES OWN LOGGING	2. CUSTOMER EMPLOYS CONTRACTOR TO DO LOGGING	3. CALM SUPPLIES CUSTOMER VIA A SINGLE CALM LOGGING CONTRACTOR	4. CALM SUPPLIES CUSTOMER VIA TWO CALM LOGGING CONTRACTOR	5. CALM LOGGING CONTRACTOR DOES FALLING, EXTRACTION & LOADING: CUST. EMPLOYS CARTAGE CONTRACTOR TO CART
WHITE ORIGINAL	TO CUSTOMER THEN TO LOCAL CALM OFFICE AS ARRANGED BY CALM	ditto	ditto	ditto	ditto
PINK DUPLICATE	TO CUSTOMER	ditto	ditto	ditto	ditto
GREEN TRIPLICATE	TO CUSTOMER	TO CUST.'s CONTRACTOR	TO CALM'S LOGGING CONTRACTOR	TO CALM'S LOGGING CONTRACT DOING THE CARTAGE. OTHER CONTRACTOR MUST BE GIVEN PHOTOCOPY OF WHITE ORIGINAL BY CALM	TO CUST.'S CARTAGE CONTRACTOR CALM'S CONTRACTOR MUST BE GIVEN PHOTO-COPY OF WHITE ORIGINAL BY CALM
YELLOW QUADRUP-LICATE	STAYS IN BOOK	ditto	ditto	ditto	ditto

Note:
1. Separation of D/Note into its copies must not take place until logs are measured or weighed.
2. CALM bases all invoicing to customers and all payments to CALM logging contractors on white original copy only.
3. Yellow copy always stays in book as backup copy if all others "go astray".
4. Completed D/Note books must be returned to CALM office from where books were issued.
5. Unless otherwise arranged, the customer must keep the white original copy of the D/Note at his sawmill to enable mill landing inspections to be carried out.

6. Computer file maintenance

The acceptance by the computer of completed D/Notes from a specific operation relies on the prior input of certain base information into the computer's files. This is known as "file maintenance" as distinct from input of D/Notes ("data entry"). File maintenance is the responsibility of either Timber Production Branch at S.O.H.Q., the relevant Regional Inventory Section, or the relevant District. Section C of the User Manual details the file maintenance requirements.

7. CLM 709H

Districts must provide information on every logging operation on form CLM 709H ("Hardwood Logging Operation Prescription") (Attachment 7.4.1). This form must be completed and forwarded to the relevant Regional Inventory Section before an operation is started. The completion of this form requires a clear understanding and knowledge of the Hardwood Logging Computer System and the details of the specific operation.

Before the start of each licence year, it is advisable that District staff and Regional Inventory staff meet to jointly prepare all CLM 709H forms to cover all planned operations for the forthcoming licence year. To assist in the compilation of the CLM 709H form, the attached copy contains references to the relevant Appendices in the Hardwood Logging System Manual.

8. Recording Timber from Private Property

Timber from private property delivered to a "Crown Land Mill" (that is a mill operating under a Departmental licence or Contract of Sale) must be recorded on D/Notes. However, as private property timber is not considered part of the P.I., the source of the timber must be given a special code, as explained in Section E4 of the Hardwood Logging Computer System User Manual.

9. Rates and Prices

The Timber Production Branch of the Department produces and maintains an official "Operator's Rates, Departmental Price List". This is a yellow folder containing lists of:

(i) royalties, stumpages and standard Departmental logging charges,
(ii) schedules of rates for Departmental logging contractors, and
(iii) schedules of prices for log products produced by Departmental logging contractors.

Each District is required to maintain a copy of this folder.

Amendments to the Price List usually take place:-

(i) on 1 April and 1 October each year to accommodate CPI increases on royalties, stumpages and standard Departmental logging charges,
(ii) on 1 January and 1 July each year to accommodate CPI increases on contractor's rates, and
(iii) at any time to accommodate a general royalty/stumpage review.

1 November 1987

DEPT. OF CONSERVATION AND LAND MANAGEMENT

CLM 709 H1

HARDWOOD LOGGING OPERATION PRESCRIPTION

OPERATION CODE: ☐ ☐☐ ☐☐ ☐☐

1.0 LOCATION:

DISTRICT: Appendix 4 | BLOCK: Appendix 13 | CMPT: | COUPE:

PLAN AREA: Appendix 17 ☐☐ | ROYALTY AREA: ☐☐ Appendix 18 | DRA (Y/N): ☐ | % CUT OVER: ☐☐☐

2.0 OPERATION:

SPECIES (Appendix 1)	CODE	PRESCRIPTION (Appendix 10)	CODE	AREA (HA)	PRODUCT YIELD DATA									
					SAWLOG		CHIPLOG		SALVAGE					
					EST.	ACT.	EST.	ACT.	EST.	ACT.	EST.	ACT.	EST.	ACT.

SOURCE OF YIELD ESTIMATE:

3.0 APPROVED PERIOD: (As per License or Contract of Sale)

FROM: ☐☐ DAY ☐☐ MONTH ☐☐ YEAR TO: ☐☐ DAY ☐☐ MONTH ☐☐ YEAR

Attachment 7.4.1

HARDWOOD LOGGING OPERATION PRESCRIPTION

CLM 709 H2

4.0 CUSTOMERS:

PRODUCT	CODE	MILL	CODE	MILL DISTANCE (km)	LICENCE TYPE & NUMBER
Appendix 2		Appendix 6			

5.0 CONTRACTORS:

PRODUCT	CODE	CONTRACTOR	CODE	WORK CODE	COMMENTS
		Appendix 12		Appendix 15	

6.0 GENERAL COMMENTS:

7.0 AUTHORISATION:

COMPILED BY:.....

OP. APPROVED BY:.....

CONTRACTOR APPROVED BY:.....

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.5 LOGGING CONTRACTS

1. There are two types of logging contracts initiated by CALM:
   (i) Contracts to supply, and
   (ii) Contracts of sale.

1.1 Contract to Supply

This is where a logging company is contracted to supply, to CALM, one or more types of forest produce from State Forest, as planned and directed by CALM. In this case "supply" may involve one or more of the following:-

(i) "production" of the produce (i.e. falling, extracting, and preparation and sorting).
(ii) loading and
(iii) 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.

A Contract to Supply may also involve measurement of logs before they leave the bush.

When logging in D.R.A. under a Contract to Supply the current policy is to restrict the haulage component for all products from that operation to the in-bush contractor to minimise the risks of introduction and spread of dieback. In some cases, provided dieback hygiene is not compromised, a different company may be engaged to carry out the haulage component of a logging operation in D.R.A.

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 86/J3 was commenced in 1986, it involves jarrah, and it was the third contract signed in 1986. 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 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 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 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).

The total of the above costs is sometimes referred to as the "upset" or "reserve" price.

SPECIFICATION 7.6 REGISTRATION OF TIMBER WORKERS AND BRANDS

1. All persons regularly engaged in the cutting and removal of timber from State Forest or timber reserves must be registered, as required in Section 128(1)(d)(v) of the CALM Act. "All persons" includes the manager of any mill obtaining log supplies under a licence granted by the Department, but does not include persons employed at that mill. Persons who only occasionally cut and remove timber from the forest, for example once-off or occasional minor forest produce operators, are not required to be registered.

2. To be registered, a timber worker must complete an Application For Registration as a Timber Worker (Form CLM 014, Attachment 7.6.1). This application must be recommended by a Local Forest Officer then forwarded to S.O.H.Q. After endorsement by S.O.H.Q., a local Forest Officer may then issue that person with a Timber Workers Certificate (CLM 430) in return for the appropriate fee. A Timber Workers Certificate must be renewed annually.

3. **Fallers Brands**

   Every person engaged in felling of timber (except minor forest produce operators) must have a registered brand. A brand, used to brand stumps of trees felled, and all logs produced, must be applied for in the same way as a Timber Workers Registration Certificate.

   Before recommending an application for registration of a brand, a Forest Officer should satisfy himself that the faller is sufficiently proficient to be a registered faller. This may involve the observation of the applicant as he works under the guidance of an experienced faller, or the performance of the applicant in a short test. A forest officer should not recommed issue of a brand until he is satisfied that the applicant is competent.

4. Timber from Private Property

All sawlogs, and bridge and jetty timbers, cut on private property, must be distinctly branded with the registered brand of the owner of the private property, before such timber leaves that property. To obtain a brand a private property owner must complete an Application for Registration of Private Property Brand (Form CLM 083, Attachment 7.6.2). This form must be fowarded to S.O.H.Q. with the appropriate fees. Once a brand is issued, the holder may use that brand on all timber cut on any property he lawfully owns.

In cases where timber is "resumed" from private property, for example by the Main Roads Department, then the private property owner is not required to hold a brand. In these cases, a written authority will be issued by the Government Department concerned to the contractor removing the timber.

1 November 1987

Attachment 7.6.2

CLM 083

DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT

Executive Director
50 Hayman Road
COMO WA 6152

Pursuant to the provisions of the Conservation and Land Management Act,

I ..... Please print name clearly

of ..... Please print address

..... clearly

* (1) the registered proprietor of the following locations

or

* (2) claim ownership of the following locations by virtue of

.....

.....

Name of Land District	Location Nos.	Title or Lease Nos.

and being the lawful owner of the timber growing or standing thereon, hereby apply to be registered as the holder of a brand to be supplied by the Department of Conservation and Land Management.

And I hereby undertake that the said brand shall be used for the purpose of marking the timber obtained from the said land (or any other private property in connection with which it shall be competent for me to use this brand in accordance with the Conservation and Land Management Act, 1984 and the regulations thereunder), and for no other purpose whatsoever and I hereby agree that any Forest Officers authorised by you may, for the purpose of ascertaining the quantity and description of timber removed therefrom, enter upon such private property.

DATED at ..... this ..... day of 19

(signature of applicant) .....

This application should be forwarded to the Executive Director, Como together with fees as prescribed in the Forest Regulations "Scale of Fees" plus the price of hammer and postage.

* Strike out (1) or (2). If an applicant is not the registered proprietor of the land in respect of which he makes application, it will be necessary for him to state specifically how he claims ownership, e.g. under contract of sale, etc.

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.7 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 firstly consider (i) the tenure and land use priorities of the area in question and (ii) the estimated volume of log product involved.

3. If logging is authorized on the area in question, the log products may be either:

   (i) included in an existing FP(S)L holder's annual sawlog allocation,
   (ii) included in an existing Contract of Sale customer's annual log allocation,
   (iii) offered for sale by auction or tender,
   (iv) sold under a prepaid Minor Forest Produce Licence.

4. The decision as to which option to pursue rests with the Manager, Timber Prodution Branch, unless the volume involved is less than $50m^3$ in which case the District Manager may, when standard procedures are impractical, use option (iv).

5. In normal circumstances the District Manager must, when confronted with supplementary cutting, recommend to the Manager Timber Production Branch (via the Regional Manager) the best course of action to pursue.

6. The recommendation should include:

   (i) the area and location of the resource,
   (ii) the volume 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, the name(s) of the CALM log customer(s) to which the log products may be allocated, and
   (v) a time scale of the proposed logging operation.

7. CLM 49B plans must be prepared if the sawlog resource from a supplementary cutting area is allocated to a "Head Office" licensed sawmill. (See Specification 7.1)

1 November 1987

SPECIFICATION 7.8 MILL LANDING INSPECTIONS

1. Log landings at all Crown Land Mills within a CALM administrative District must be inspected by a District Forest Officer. The inspections should be carried out at least twice per month, but not on the same days each month.

2. 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 "Mill Log Landing Inspection Record Book" (CLM 096). 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 and measuring logs and the recording of measurements on the D/Notes, must be (i) recorded in the "Record Book" and (ii) reported promptly to S.O.H.Q. 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. Specification 7.3 lists all Crown Land sawmills in the Forest Regions with the CALM District responsible for landing inspections.

1 November 1987

SPECIFICATION 7.9 USE OF LOGS FOR BUSH OR MILL LANDING CONSTRUCTION

1. A District Manager may approve the removal of trees by a sawmiller operating under a Head Office FP(S)L for use in the construction of bush or mill landings. The District Manager 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 of low or "reject" quality. The Department does not charge royalty for such logs.

3. Logs used in mill landing construction are a recognised log product type. "Mill Landing Construction" logs must be recorded on a Delivery Note in the normal fashion, and must be below normal sawlog standard in quality. Royalty is charged for such logs.

1 November 1987

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.10 CONDEMNING OF LOGS

1. Log products that do not meet written specifications may be condemned by a Forest Officer at either (i) the stump (ii) the bush landing or (ii) the customer's mill landing.

2. Consistent with the need for full utilization, the FOIC must take all reasonable steps to ensure that all logs hauled from a logging operation under his control meet the relevant written specification.

3. At the stump or bush landing, below standard logs may be condemned by the Forest Officer in Charge of the logging operations, or by any Forest Officer under the FOIC's control. Such logs are marked with a yellow crayon cross on one end. This "crossing out" also implies that the log in question is unsuitable for preparation into any alternative log product that may be produced under the terms and conditions of that particular logging operation.

4. Logs may be condemned at a mill landing only if delivered to that landing by a CALM contractor or if the logs were loaded onto buyers transport by a CALM contractor.

   Only the the authorised Regional Forest Officer responsible for hardwood procurement may condemn such logs. No other CALM officer or person has the authority to condemn logs once delivered to a mill.

5. Any logs condemned at a mill landing by the authorised Regional Forest Officer must be measured or weighed, and recorded on a Hardwood Log Credit Note (CLM 076 or CLM 810).

1 November 1987

SECTION 7 - ADMINISTRATION

SPECIFICATION 7.11 PRODUCTION AND SALE OF ROUND TIMBERS BY CALM

1. The Products

- poles may be (a) SEC poles - i.e. poles produced to SEC specifications, or (b) "other" or "private" poles - i.e. poles sold to customers other than the SEC.

- bridge and jetty timbers include piles, stringers nad corbels, and are produced for sale to (a) Government Departments (e.g. MRD, Marine and Harbours), or (b) private customers.

Collectively, the above products are referred to as "round timber", because they are logs that are used "in the round".

2. Production

"Production" involves the falling, extraction, loading and carting of round timbers to CALM pole dumps, or other nominated delivery points, at rates as set out in the Contracts to Supply agreed to by CALM and the various contractors. The contract rates for production of round timbers generally include "preparation" of the material to set specifications (see 4. below).

Production of round timbers may be carried out only by authorised CALM contractors. These currently are:-

i) V & D Ridolfo (Contract 85/J3)
ii) R & N Palmer (Contract 86/J3)
iii) Bunning Bros (Contract 86/H4)
iv) AG & AM Brookes (Contract 85/H1)
v) Pine Hauliers (Contract 84/P1) for pine only.

Occasionally, other contractors may be engaged to produce round timbers on a one-off basis. In these cases, a quote is accepted by CALM.

3. Rates of Production

Unless otherwise advised by either the Manager, Timber Production Branch or the Department's Chief Utilisation Officer (Mr Des Donnelly) round timbers must always receive highest priority in any hardwood logging operation.

4. Preparation

"Preparation" is the task of preparing the produce to a set specification, and includes debarking, trimming, banding, sealing ends with sealing compound, etc. Preparation is normally carried out in a central location known as a "pole dump".

4.1 SEC poles: two contractors are currently authorised to prepare poles to SEC specifications. They are

i) V & D Ridolfo - operator of the Dirkbrook pole dump.
ii) R & N Palmer - operator of the Worsley pole dump.

Poles produced by Bunnings, Brookes and Pine Hauliers must be prepared by either Ridolfo or Palmer. Such poles are normally directed to the nearest pole dump for preparation.

4.2 Bridge Timbers: three contractors are currently authorised to prepare bridge timbers. They are:

i) V & D Ridolfo - operator of the Dirkbrook pole dump.
ii) R & N Palmer - operator of the Worsley pole dump,
iii) Bunnings Bros - operator of Deanmill pole dump.

Bridge timbers produced by Brookes must be prepared by either Ridolfo or Palmer.

5. Inspection

It is CALM's hope that all round timbers will be inspected by CALM's timber inspection service to guarantee adherence to specifications. Currently, all round timbers prepared for sale to any Government Department must be inspected and passed by a CALM round timber inspector. Round timber destined for non-Government use may or may not be inspected, depending on (i) the customer's requirements, (ii) the availability of round timber, and (iii) the decision of the Department's Chief Utilisation Officer.

6. Stockpiling and Storage

Because of dieback and soil damage it may not be possible to supply round timber all the year round from current bush operations. The SEC are prepared to accept production "as and when available" and pay accordingly. All storage and stockpiling is therefore at the SEC expense with stocks being held in either Worsley or Dirkbrook pole dumps. All other Government customers prefer year round availability and therefore CALM has accepted that stockpiling at CALM expense is needed for wanted items in short supply. The Chief Utilisation Officer is responsible for deciding

(a) which items should be stockpiled
(b) how much of each item should be stockpiled
(c) when stockpiled items can be sold
(d) to whom stockpiled items can be sold.

Stockpiled items should if at all possible be held in waterspray storage to avoid deterioration. If this can be provided the round timber is generally stored fully prepared. If waterspray storage is not available the Chief Utilisation Officer will advise how the stockpiled material is to be held e.g. bark on, unprepared etc.

7. Sale

Round timbers can be sold by CALM at one of four points:-

i) At a CALM pole dump, after the material has been prepared, inspected and passed.

ii) At a CALM pole dump, after the material has been prepared, inspected and rejected.

iii) At a CALM pole dump, as reject material (i.e. round timber that is not prepared for inspection), and

iv) At bush landing to approved customers only and only if not required for CALM priority customers.

At all times the priority customers are Government Departments, i.e. SEC, MRD, Marine and Harbours etc. All round timber delivered to a CALM pole dump must be produced with the intention that the timber be prepared to Government specifications. Forest Officers in charge of bush operations must not permit round timber of the desired sizes to be carted to pole dumps if such material has no chance of meeting Government specifications. Alternative sizes and specific production to meet individual private orders can be produced if approved by the C.U.O.

7.1 Sale of passed timber: timber passed at CALM inspection is sold under Contracts of Sale at negotiated prices. These prices include -

i) the cost of production and preparation at pole dump.
ii) an administration charge on the cost of production,
iii) a charge for in-forest costs,
iv) a roading charge,
v) an inspection fee, and
vi) royalty.

The cost of inspection of material prepared in good faith to S.E.C. specification, inspected by a CALM inspector, and subsequently rejected is charged to the S.E.C. This practice does not apply to other Government Departments at this stage.

Round timber prepared and passed to a Government specification may be sold to a non Government customer at listed prices set by CALM, only if and when authorised by the Chief Utilisation Officer. Such customers may include CALM contractors. Such authorisation will be given only when the supply for Government orders is not likely to be jeopardized.

As this material has been passed in accordance with nominated specification royalty is to be charged on the basis listed in "Schedules of Royalty Part 6 - Hardwood Poles and Bridge Timber (except SEC poles) or Schedule of Royalty Part 8 - SEC poles.

7.2 Sale of prepared and subsequently rejected material: in many cases, round timber prepared to a set specification, then rejected by a CALM inspector, is docked by the contractor then presented again for inspection.

For material unable to meet the Specifications, despite docking, CALM can authorise sale as either:

i) "private" poles, piles etc.
ii) First Grade sawlog,
iii) fencing material. or
iv) firewood.

The authority to initiate sale of this material (except sawlogs) lies with the Forest Officer in Charge of the respective pole dumps, as advised by his District Manager. As necessary, the Chief Utilisation Officer and/or Regional procurement staff should be consulted.

Private poles, fencing material and firewood may be sold under a Minor Forest Produce Licence, using the appropriate royalty, to the CALM contractor. CALM does not pay the contractor to produce these products.

Sawlogs may be sold direct to a nearby sawmill or they may be sold by Auction or Tender. In these cases CALM must pay its contractor. The Manager, Timber Production Branch, must authorise all sales of sawlogs.

7.3 Sale of reject material: sale of round timber that is rejected by the pole dump operator without being prepared may be sold as in 7.2 above.

7.4 Sale at Bush Landing: poles and bridge timber material may be sold at bush landing under Contract of Sale only if authorised by the Chief Utilisation Officer. This authorisation will only be given when the supply of such timber for Government requirements is not likley to be jeopardised. Sale of such timber at bush landing will be authorised only to Departmental contractors, at listed prices set by CALM. These prices will include:-

i) royalty
ii) the cost of production
iii) an administration charge on the cost of production
iv) a charge for in-forest costs, and
v) a roading charge.

NB: The sale of round timbers which are capable of providing poles piles or bridge timber to private customers, at the stump, using a Minor Forest Produce Licence, must be restricted to special, one-off situtions as authorised by Timber Production Branch. District staff should wherever possible direct enquiries for round timbers to -

i) the Chief Utilisation Officer if the order is large, or if the order is for high quality material, or

ii) the nearest CALM pole dump if the order is for small amounts of relatively low quality material.

1 November 1987

SPECIFICATION 7.12 SEIZURE OF FOREST PRODUCE

1. A Forest Officer may seize any forest produce which he believes has been illegally obtained. The procedures for carrying out seizure of produce, and the taking of written statements, must be understood and carefully followed.

2. **Seizure of Forest Produce**

2.1 Forest produce upon which any royalty dues or charges are payable may be seized in the forest, on a landing, on a truck, at a mill, or at some other place.

2.2 Forest produce suspected to be the property of the Crown, on private property may only be seized under warrant. The Forest Officer may complain to a Justice of the Peace, who can in turn issue a warrant to the police to search for the produce in question.

2.3 Forest produce seized must be clearly stamped or marked with:-

(i) a broad arrow punch,

(ii) the word "seized", the officers name, and the date, in timber crayon, and

(iii) a "Notice of Seizure" label, completed with a permanent marking pen.

If the above equipment is not immediately available, seized produce may be marked with any available marking material. Where forest produce in a whole or part stack is seized the stack should be clearly identified eg. with yellow tape and a section of the seized produce stamped or marked as above.

2.4 A full report on the seizure must be forwarded without delay to S.O.H.Q. via the Regional Office. Accompanying the report should be original copies of statements taken, and a completed form CLM 259 (Attachment 7.12.1). Included in the report should be a recommendation as to the method of disposal of the seized produce.

2.5 Persons from whom forest produce has been seized for non-payment of royalty dues or charges must be given at least 10 days in which to pay such royalty dues or charges.

3. Procedure for taking Written 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 witnesses, the original copy to be held by the officer taking the statement for court evidence, if required.

3.2 Persons 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 infrigement 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.

Attachment 7.12.2 is a proforma for use when taking a statement.

1 November 1987

Attachment 7.12.1

Form CLM 259

REPORT CONCERNING ILLEGAL CUTTING OR REMOVAL OF TIMBER OR OTHER FOREST PRODUCE

Full names and addresses of Offenders _____

_____

Nature of Offence _____

_____

_____

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 _____ Registered No. _____ Owner _____

If employee, employed by whom _____

Quantity of timber or forest produce removed _____

To whom supplied _____

Is it saleable_____ Value _____ Likely buyers _____

Purpose for which obtained _____

Was trespass deliberate or accidental (State reasons for opinion) _____

_____

Was area fenced or blazed (give particulars) _____

Could direction of removal be seen by tracks etc. (Give particulars) _____

_____

Has offender been previously reported or warned _____

Is offender a registered timber worker _____

Further particulars _____

_____

_____

Recommendation: _____

Statements obtained and attached hereto: _____

Did offenders refuse to give written statements _____

Place _____

Date _____

_____

Forest Officer

Attachment 7.12.2

CLM .....

(1987)

STATEMENT BY PERSONS APPREHENDED BY AN AUTHORIZED CALM OFFICER

Please be advised that I .....

Address:

.....

.....

Occupation:

was apprehend 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 7.13 RESPONSIBILITIES OF THE FOREST OFFICER

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 in the Certificate.

2. To be designated as Forest Officer, it is likely that a graduate of the CALM Department's cadet training school will be required to complete about two years of on-the-job training.

3. To carry out the responsibilities of a Forest Officer in dealing with the hardwood logging industry, a Forest Officer must not only possess adequate knowledge and bush skills, he must possess sound people-management skills. The attached notes, written by R.J. Underwood in 1979, are relevant to this subject. (Attachment 7.13.1).

1 November 1987

THE APPLICATION OF MANAGEMENT PRINCIPLES TO CONTROL HARDWOOD LOGGING OPERATIONS IN THE FIELD

1. INTRODUCTION

As a Forest Officer in charge of a logging operation in the hardwood bush, you are responsible for the direction and control of the timber industry in the forest, the prevention of waste and the protection of the forest from damage and disease.

This is a complex and difficult job. It requires firstly that you have a very clear knowledge and understanding of Departmental standards and requirements and secondly, considerable management skills in achieving these requirements through other people.

In this context.

1.1 "Departmental Requirements" means maximum utilisation of the log resource of each hectare cut, but with minimum damage or disturbance to the forest, the soil and other values such as water, fauna, landscape and scenery; and

1.2 "Other People" refers to the Bush Bosses, Fallers, and drivers of Skidders, Loaders, Trucks, etc. who are employed by the timber companies to extract maximum log value at minimum cost from the forest.

Thus, there is always a conflict of interests in any logging operation. Your job is to ensure that this conflict is resolved in the best interests of the forest and the Department.

To do this, you must be an efficient manager, i.e. one who can apply these basic management principles:-

(1) Ensure everyone involved has a clear understanding of what is required of him i.e. Train Industry personnel in correct standards and procedures.

(2) Employ a control system to check whether required results are being achieved i.e. make regular inspections to prepared checklists.

(3) Take remedial action when unsatisfactory activities are discovered i.e. those not following your instructions must be identified and retrained or disciplined as required.

2. INDUSTRY TRAINING

No-one can be expected to "do the right thing" if he has not first been thoroughly trained as to what is expected of him. Effective training is basic to all good management.

An effective training programme has five parts to it: (i) Decide what needs to be known and who needs to know it; (ii) Draw up a training format; (iii) carry out the training; (iv) test to see that it has had the right effect, and (v) retrain where necessary.

Industry training must be carried out at three levels: by Region, by District and by Logging Operation. It is the responsibility of the Regional Leader (Industry Control) to co-ordinate these levels and to lay down required standards and specifications.

The Forest Officer in Charge (FOIC) is responsible for the training of the Industry personnel in the operation he controls.

Here, you should start by drawing up and maintaining a chart which lists the personnel on your permit, what they need to know and records training.

For Example:

	Personnel				
	Bush Boss	Fallers	Skidder Drivers	Swampers	Grader Driver
Log Specifications Erosion Control Dieback hygiene Soil Disturbance Gravel Pit Working etc.	(Indicate Training Equipment & Progress)				

These charts can be filed in your operations folder where they can be constantly referred to and updated, and demonstrated to your senior officer when he visits the logging operation.

Training Methods can vary from a session in the office with slides to a chat around a stump with issue of notes or specifications. In all cases you must plan and organise these sessions in conjunction with the Bush Boss. His co-operation will improve the chances of success.

By constant emphasis on Departmental standards and insisting that they are met, you will enhance your overall control, personnel management expertise, and ensure that each operator really knows what is expected of him.

3. LOGGING OPERATION INSPECTIONS

A great deal of time can be wasted on inefficient logging operation inspection. To avoid this, you should always work to a checklist.

This ensures no aspects are overlooked and also forms a record you can refer back to, or discuss with a senior officer.

It is also very useful to give a copy of your completed checklist (or similar document with an enlarged H.O.C.S. sheet if necessary) to the Bush Boss if there are problems he must attend to, or if you wish to record his excellent performance. This eliminates misunderstandings and claims that "no-one told me so".

When inspections reveal serious errors or malpractice by the industry, you must decide:-

(i) Was it due to ignorance on the part of the operator or his supervisor? If so, training needs are revealed and must be immediately and thoroughly attended to.

(ii) Was it a deliberate or repetitive act despite warnings and training. In such cases tough action (eg. letter to his employer from your OIC) is required, and essential. There have been cases when a Bush Boss deliberately sets up a young officer to see how much he can get away with. If you overlook a misdemeanour once, it becomes doubly hard to deal with next time.

All Forest Officers can be assured of strong backing from their senior officers in dealing wich such cases.

4. GIVING INSTRUCTIONS PROPERLY

Experience over many years has shown that most management problems on permit (and elsewhere) can be avoided if the process known as "Giving instructions properly" is followed. This means ensuring that you follow three essential steps each time you arrange for a job to be done.

1. Specify the Task
   Clearly state your exact requirements. This is best done by issuing a written prescription or specification.

2. Reach Understanding about the Desired Result
   Make sure the person you are dealing with really understands what you require of him. This is best done by asking questions or seeking his interpretation of the how and why and when of the job.

3. Set and Make Checkpoints

When the task is assigned or the instruction given, arrange an inspection at a set date and time.

Then you can check standards or progress and attend to unforseen problems or changed circumstances if these occur.

I regard these three steps in "giving instructions properly" as the Golden Rules of personnel management. They should be applied throughout your work in the field, and then, as in dealing with the Industry, you will find many errors are avoided and valuable time saved.

5. SOME FURTHER POINTS

5.1 Goal and Target Setting

Superior management nearly always results when people have clear goals and targets to work to. Each officer controlling a logging operation should set himself a number of personal goals which he can positively strive to achieve. For example: -

(i) Set yourself production targets for completion of various tasks. These can be incorporated into the weekly programmes you draw up in conjunction with your D/F.

(ii) Set yourself a goal that no instances of poor utilisation will be discovered by a senior officer inspection.

(iii) Set yourself the goal of gaining a reputation as the most efficient logging operation manager in the District. Develop a self-image that "you are the greatest" when it comes to supervising and controlling the Industry.

If high standards are set and achieved, morale and job satisfaction soars.

5.2 Act Consistently

If you know the rules and always insist that they are followed, you will become known as that ideal manager who is "hard but fair", someone with whom "you know where you stand". An inconsistent boss who lets some things go one time, but who rants and punishes the next, will never succeed as a manager.

In the same vein, learn to resist persistent pressure over certain issues. Certain sections of the industry have a long record of arguing and aruging over a particular ruling until the poor forester finally gives in to get a little peace. Recognise this tactic when it is used and handle it by being as tough and persistent in defence as they are in attack.

5.3 If in doubt, don't Commit Yourself

Problems will sometimes arise to whcih you don't have the answers. These most frequently involve interactions with other logging operations or the Regional Logging plan. When this occurs, say "wait" and seek a ruling from a senior officer. It is always better that you do this, than try to bluff your way through a seeming little local issue which might have repercussions across the region.

5.4 Prevention is Better than Cure

The good manager schools himself to look ahead, anticipate problems nad then nip them in the bud, rather than wait until a crisis occurs.

This is particularly relevant to demarcation of coupe boundaries and problems of soil damage on steep slopes.

5.5 Be Adaptable

The theme of much modern management training is "the challenge of Change". We live in dynamic times, with new problems and new ways of handling them cropping up almost daily. This is particularly true in hardwood logging. The key to this situation is firstly, prepare yourself for, and expect changes to occur. Secondly be flexible enough to adapt your techniques as new requirements are placed on you.

5.6 Accept Losses Gracefully

No-one wins all the time (though you should always aim to do so!). Factors beyond your control (or even the Department's control) may sometimes mean you must temporarily back down from a position of strength. The Department may sometimes see the need to create a strength somewhere else, which means accepting a loss in your area.

If this happens, whinging or sulking is not the answer. Accept that you are part of an overall offensive, whose broad implications you may not fully understand. However, this should not prevent you from listing the consequences in a calm and logical way to your senior officers, and with his help, plan your campaign to cut your losses in the most efficient way.

Similar situations are a fact of life in any organisation. You will face them again and again in such areas as Estimates and Works Programmes, Fire Control, Staff and Manpower availability.

5.7 Act the Part

That great soldier Sir William Slim, once said to his Army Commanders: "It is not simply enough to be efficient - you must also look efficient:.

When you deal with the industry, be proud of the fact that you are a highly trained forest officer, a representative of a determined and efficient organisation. You, not the Bush Boss or Skidder Driver, are the elite of the forest. Dress neatly, keep your vehicle and equipment in good order, speak with calm authority, being always courteous but firm.

Control, morale and authority is as much a pyschological thing as a physical thing, (as Slim recognised) or a matter of age or bushcraft.

5.8 Giving Credit Where Due

Remember the old adage: "criticise in private, but praise in public". If the Industry or your logging operation performs well, or perhaps goes out of its way to do the right thing, get them together as a group (over crib, for example) and say so. Recognition or praise for a job well done is one of the most effective forms of encouragement. The men in the bush seek job satisfaction as much as you do.

However, public criticism has the opposite effect and can generate group resentment. It is far better to identify the problem person and deal with him and his immediate supervisor in private.

6. CONCLUSIONS

Efficient industry control in the field can be one of the most satisfying jobs for a young officer. It is an invaluable opportunity to practise the skills of management, which can stand you in good stead in your future career as a forester.

On the other hand, when things in the field get into a mess, a miserable time is had by all.

Because of the complexities of the operation, and conflicting interest, hardwood logging control is rarely simple and straightforward. But, by the application of sound management principles, viz:

1. Know what you want.
2. Make sure the people under your control know what you expect of them, and
3. Give instructions properly,

your control will be stronger, your time spent more efficiently and the rewards from your efforts greater.

R J UNDERWOOD (INSP.)

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