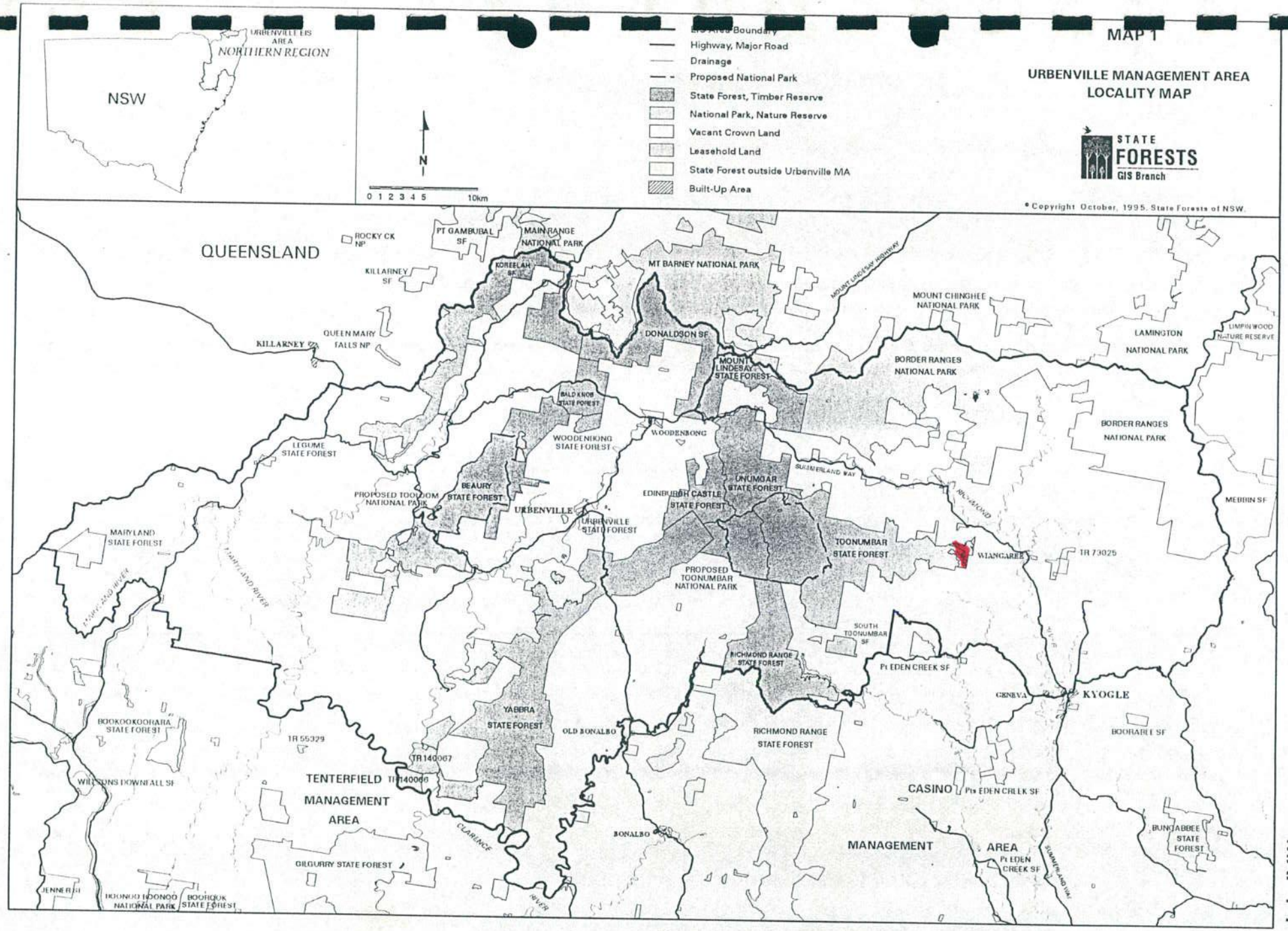
TOONUMBAR

305-309 & 314-316

Urbenville District
Northern Region


MAP 1
URBENVILLE MANAGEMENT AREA
LOCALITY MAP
STATE FORESTS
GIS Branch
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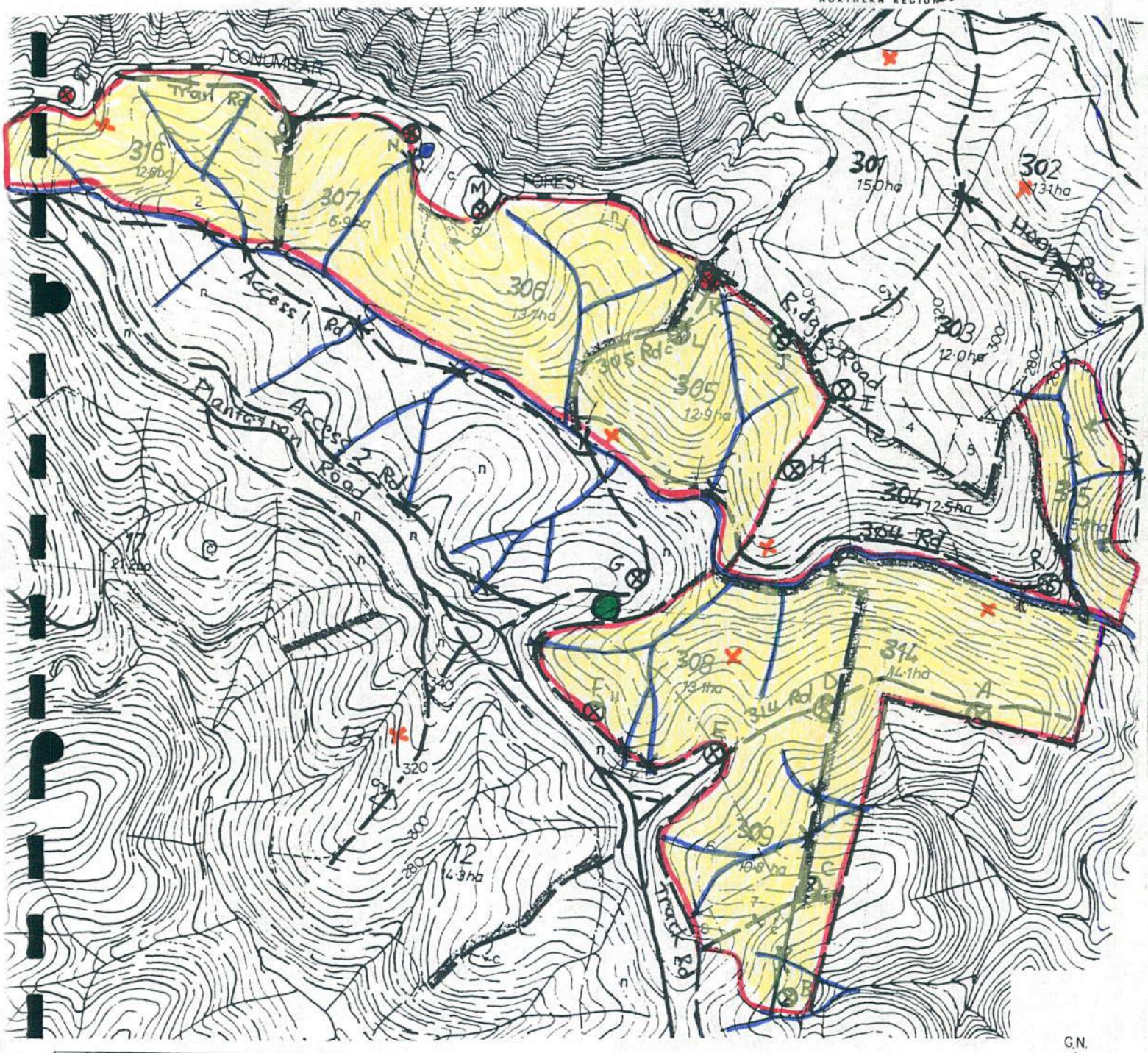
URBENVILLE EIS AREA
NORTHERN REGION
NSW
Highway, Major Road
Drainage
Proposed National Park
State Forest, Timber Reserve
National Park, Nature Reserve
Vacant Crown Land
Leasehold Land
State Forest outside Urbenville MA
Built-Up Area
N
0 1 2 3 4 5 10km
QUEENSLAND
ROCKY CK NP
PT GAMBUBAL SF
MAIN RANGE NATIONAL PARK
KOREELAH SF
KILLARNEY SF
KILLARNEY
QUEEN MARY FALLS NP
MT BARNEY NATIONAL PARK
MOUNT LINDESAY HIGHWAY
MOUNT CHINGHEE NATIONAL PARK
LAMINGTON NATIONAL PARK
LIMPINWOOD NATURE RESERVE
DONALDSON SF
MOUNT LINDESAY STATE FOREST
BORDER RANGES NATIONAL PARK
BALD KNOB STATE FOREST
WOODENBONG
WOODENBONG STATE FOREST
LEGUME STATE FOREST
BORDER RANGES NATIONAL PARK
SUTHERLAND WAY
UNUMGAR STATE FOREST
BEAURY STATE FOREST
PROPOSED TOONUMBAR NATIONAL PARK
URBENVILLE
URBENVILLE STATE FOREST
EDINBURGH CASTLE STATE FOREST
RICHMOND
MEBBIN SF
MAIRYLAND STATE FOREST
MAIRYLAND RIVER
TOONUMBAR STATE FOREST
WIANGAREE
TR 73025
PROPOSED TOONUMBAR NATIONAL PARK
SOUTH TOONUMBAR SF
RICHMOND RANGE STATE FOREST
Pt EDEN CREEK SF
GENEVA
KYOGLE
BOOKOOKOORARA STATE FOREST
TR 55329
YABBRA STATE FOREST
OLD BONALBO
RICHMOND RANGE STATE FOREST
BOORABEE SF
TR 140067
TR 140066
WILLONS DOWNFALL SF
TENTERFIELD MANAGEMENT AREA
CASINO
Pt EDEN CREEK SF
CLARENCE RIVER
BONALBO
MANAGEMENT AREA
Pt EDEN CREEK SF
BUNJABBEE STATE FOREST
GILGURRY STATE FOREST
JENNEREE
BOONOO BOONOO NATIONAL PARK
BOOHOOK STATE FOREST

MAP 1-1

HARVESTING PLAN MAP

DISTRICT : URBENVILLE
STATE FOREST : TOONUMBAR
COMPARTMENTS : 305-309, 314-316

STATE FORESTS
NORTHERN REGION



0 50 100 200 300 400 500 metres

CONTOUR INTERVAL 5 metres

SCALE 1 : 10000

Compartment Boundary .....
Fence..... — / —
Filter Strips .....
Approved crossings.....
Roads:
Sealed 1st class .....
Sealed 2nd class.....
Loose 1st class.....
Loose 2nd class.....

Area To Be harvested.....
Special Emphasis .....
Feeder Road , Dump Site ..... —⊗
Wet Weather Dumps In Red .....
Soil Sample Locations .....

Dry weather vehicular track.
(within State Forest).....

RECEIVED
15 JAN 1997

1100
NORTH
15/1/97

STATE FORESTS
NORTHERN REGION

GREVILLIA MANAGEMENT AREA

CONIFER PLANTATION HARVESTING PLAN

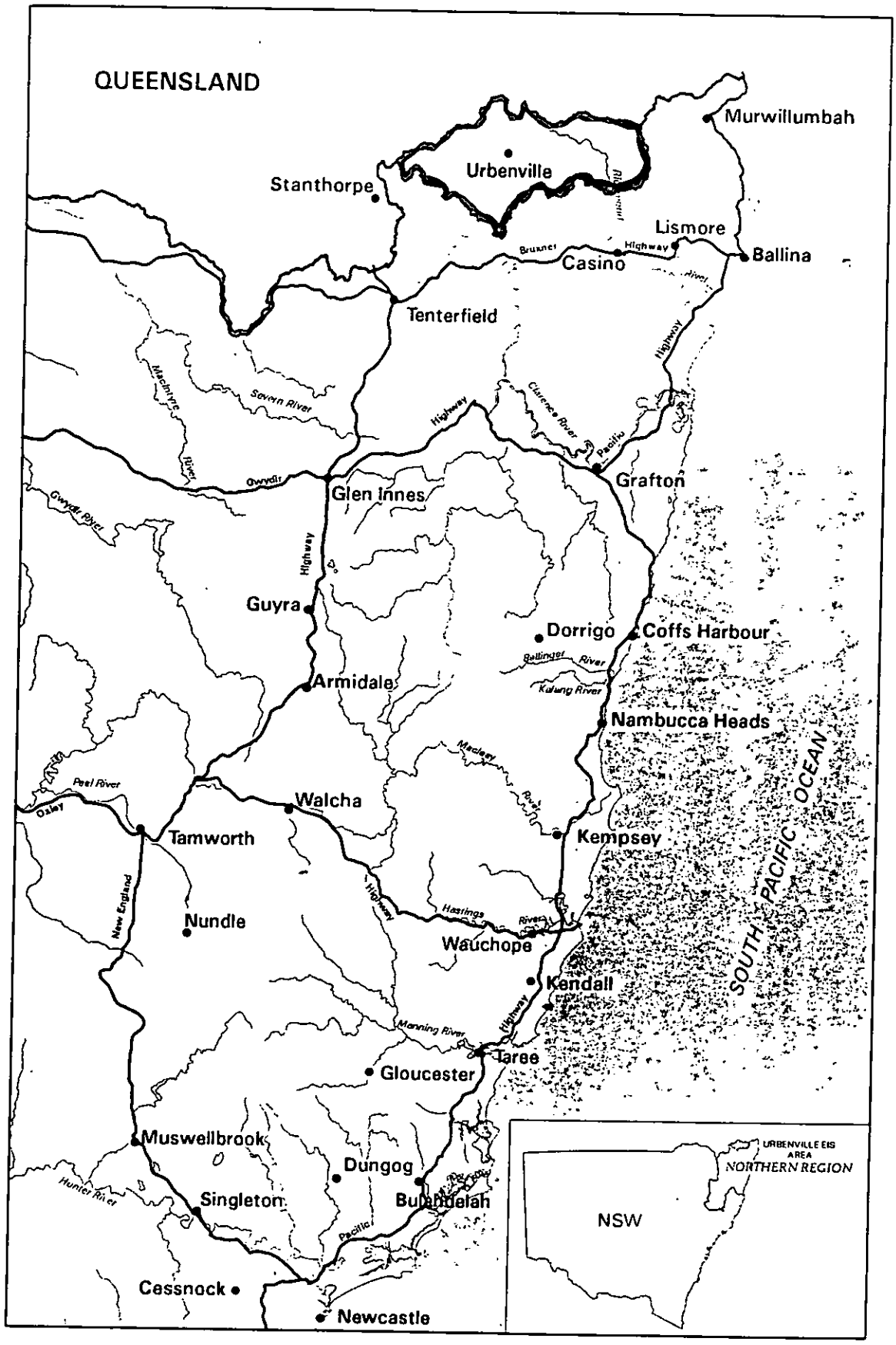
AREA:	**TOONUMBAR STATE FOREST No.343**	
LOCATION:	**Compartments 305-309, 314-316.**	
OPERATION:	FOREST HARVESTING	
PLAN No.:	**GMA CUTI/96**	16/12/96
MAP:	Grevillia CMA 9441-11-S Afterlee CMA 9440-1-N	
COORDINATES:	90804630 (SE corner)	89304780 (NW corner)

MANAGERING - CARING - SUSTAINING

FIGURE 2

URBENVILLE MANAGEMENT AREA

REGIONAL CONTEXT



Management Area

Major Road

Major River

N

Scale 1 : 2 500 000

0 10 20 30 40 50 100km

STATE FORESTS GIS Branch

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HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Harvesting Plan No GMA CUT1/96

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HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Condition 2 FOREST MANAGEMENT & ENVIRONMENTAL CONSIDERATIONS

NATURAL AND ARTIFICIAL PHYSICAL FEATURES

Description 1 Physical description of the area

STATE FOREST	Toonumbar No. 343	**DISTRICT**	Urbenville
REGION	Northern	**AGE CLASSES**	1945-1950
COMPARTMENTS	305-309, 314-316	**PLANNING UNITS**	GMA CUT1/95
THINNING STATUS	THIRD THIN		

The area consists of 73.1 hectares (nett) of Hoop pine plantation established in 1945 to 1952. Elevation is 280 -340 metres asl. The Toonumbar Pine Plantation occupies hilly to steep southerly slopes near the eastern extremity of the main range extending eastward from Dome Mountain on the Richmond Range. Drainage is into Wyndham Creek which feeds the Richmond River via Eden Creek. A filter strip forms the boundary on the southern edge. No other major water courses transverse the planning unit. There are no unusual physical or artificial features in the area. (See also Description 12.)
See attached Harvesting Plan Operational Map and the Locality Map.

Description 2 Special warning of critical boundaries or non-harvest areas

Boundary lines are clearly marked by roads and a major drainage line in the south of the Planning unit as indicated on the Harvesting Plan Map.

FOREST MANAGEMENT AND SILVICULTURAL OBJECTIVES

Description 3 Forest Crop Types

Auracaria Cunninghamiana (Hoop pine) scheduled for third thinning.

- First thinned (T1) in 1970's - 80's to a basal area of ca. 31-38m²/ha.
- T2 in 1991-3 to a basal area of approximately 32-37m²/ha.
- Basal area at present averages 44 m²/ha
- **Target basal area for the planning unit is 20m²/ha**

Description 4 Endangered flora and fauna.
An endangered plant *Corchorus cunninghamii* occurs in a 1 hectare circle adjoining compartment 308. There are no known endangered fauna (Schedule 12) species found in this part of Grevillia Management Area .

References Austeco work for Urbenville EIS 1993, NPWS North East forests Biodiversity Study 1991/93, Forestry recordings (Foresters and Employees)

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description 5 Harvesting Method

Harvesting aims to thin to a residual basal area to 20m^2 /hectare. It is anticipated that this Third thinning operation will yield 11494m^3 of veneer and 1501 m^3 of sawlog being broken into the following:

CPT	Area (ha)	Age class	Op BA (m^2)	Veneer (m^3)	Sawlog (m^3)
305	11.6	1945	44.8	1682	297
306	12.8	1946	42.5	2011	223
307	6.6	1946	45.4	1141	127
308/1	8.7	1947	46.9	1357	151
309/1	5.9	1947	45.1	871	97
314	13.2	1950	41.5	2674	297
315	5.8	1950	42.4	510	170
316	8.5	1952	43.1	1248	139

The harvesting method comprises:

Ground based mechanised felling/processing at stump, maximising utilisation;

Extraction by a wheeled skidder and a tracked machine on steeper slopes. Walkover extraction will result in minimal soil disturbance on extraction tracks;

Debarking , sorting and loading will be carried out by a tracked excavator with a log clamp;

Haulage involving the use of existing natural surface roads and gravelled roads as shown on the Map. Log stockpiles and loading areas ,(Dump sites) are marked on the map and will be used as directed by the Supervising Forest Officer.

EROSION AND WATER POLLUTION CONTROL STRATEGY

Description 6 Site soil and water data and other information

(a) Location See Map

(b) Climate

Rainfall

Average annual rainfall is 1300mm p.a. Rainfall shows a marked monsoonal influence and is characterised by periods of intensive precipitation from cyclonic activity in the summer months compared with relatively dry periods in winter and spring.

Annual rainfall erosivity for the area **R = 3320**. Monthly maximum erosivity occurs during **January, R = 664.**

Temperature

Mean temperatures for Roseberry Park, 3 km to the north of Toonumbar SF are summer 18 -29 ° and winter 4 - 19°. Frosts are rare.

These conditions result in very rapid establishment of groundcover species when soils are exposed and moist. However, this is not relevant to erosion hazard or water pollution as soil erosion mitigation and water pollution control will be effected by retention of pine needle litter and logging slash rather than the recovery of ground-cover vegetation.

Generally weather conditions will allow harvesting operations to continue throughout the year subject to normal wet weather restrictions. Occasionally operations may be stopped altogether by periods of wet. See Code of Logging Practice for Conifer Plantations.

References Rosewall C.J. & Turner J.B. *Rainfall Erosivity in New South Wales.* **Technical Handbook No. 11 (1st Edition), Soil Conservation Service of New South Wales(1992)**

Pilgrim D. H. (ed) *Australian Rainfall and Runoff - A guide to flood estimation,* **The Institute of Engineers of Australia,** (1987)

(c) Geology

The prominant geology comprises Tertiary lava sheets overlaying the Mesozoic sediment of the clarence Moreton Basin.

Bedding planes

There are no obvious bedding and fracture planes in the area. Similarly this geology is now very stable with no porous rocks or other strata overlying impermeable layers. The geology of the area presents no problems in relation to road construction.

Mass Movement

There are no signs of mass movement in the harvest area and no problems are contemplated as no road construction is needed and timber extraction will use walkover techniques.

References *1:250,000 Geological Survey (Map & Commentary) Warwick Sheet.* **NSW Dept Minerals & Energy** 1972

d) Soils

Soil types

The soils of the Planning unit are fine grained volcanics comprising moderate to high fertility chocolate kraznozems over basalt parent material. Depth above basalt rarely exceeds 1.5 m (A horizon 10-35 cm , B horizon >45 cm) and the surface texture is clay loam grading into a heavy clay subsoil.
Ten sampling sites were selected over the whole Plantation , representing typical locations within the nett harvest areas. Soil sampling sites are shown on the Harvesting plan Operational Map. Soil samples verified dispersibilty in the field.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description and profile

These soils consist of a thick plant layer over a brownish black or darkish red brown, strongly structured clay loam topsoil layer with a self mulching surface. This layer is underlain by a dark reddish brown strongly structured light clay A2/B1. All topsoil layers are characterised by abundant faunal mixing, moderate coherence and slight to moderate acidity. These layers overlie a dark reddish brown, strongly structured, strong, acid, strongly cherent main subsoil layer which usually grades into strongly weathered basalt parent material below 70 cm depth.

All sites within the net harvest are deep enough to allow cross bank or roll-over bank construction associated with roads or snig tracks.

Reference ; Soils Report Toonumbar Planation,Soil Scientist Justin Claridge, Field sampling July 1996.

Erodibility

Soil erodibility factor K is taken from the Toonumbar soil report July 1996.
Values range from 0.03 (topsoil ridgeline) to 0.025 (subsoil upper slope). A figure of **K = 0.03** has been adopted as a worst case scenario.

Texture

The topsoils are clay loams, grading to a light to medium clay in the B horizon subsoil. They are moderately well drained with a high proportion of angular and sub-angular strongly weathered rock fragments throughout the profiles on the steeper terrain.

Dispersibility

Soil Landscape Map		Soils Report Urbenville EIS (1993)
Map Scale		1:125,000
Map source		Veness & Associates 1993 (for reference purposes only)
Soil type		Chocolate kraznozems
Texture class -	**A horizon**	clay loam
	B horizon	medium clay
Method of determination		Field Texture
Comment:		Performed by Justin Claridge (Soil Scientist)
K value	**A horizon**	K = 0.03 (A1)
	B horizon	K = 0.025 (A2/B)
Method of determination		From field texture
Comment:		Adopt 0.03 as the max K value found
% clay	**A horizon**	
	B horizon	
Method of determination		
Comment		

EAT class	**A horizon**	8 Not dispersible
(if known)	**B horizon**	2-6 Sometimes dispersive
Method of determination		D2
Comment:		Conducted by qualified soil scientist under laboratory conditions

% dispersion	**A horizon**	
	B horizon	
Method of determination		

Inherent fertility

Whilst these soils are of moderate-high fertility, aspect is the major factor effecting vegetative growth. Ground cover establishment will be rapid on moister slopes, and particularly dependent on the soil moisture regime following harvesting on the drier aspects. Post harvest establishmnet of up to 90% ground-cover is expected within 12 months.

Depth to sub soils and bedrock ,

Topsoil depth: 10-35 cm Depth to decomposed rock : > 45 cm

Existing erosion

There are no areas of active erosion evident. Most erosion banks appear to have stabilised and should not become active following harvesting.

Qualified soil scientist

Justin Claridge B Sc.Hons (Soils)

(e) Landform (See Description 1.)

Slope

Approximate percentages of plantation area by slope class are:

70 % of the compartment is less than 18°, with only 5 % > 25°.

Average slope has been estimated at 12 degrees in the harvesting plan.

Terrain (See Table 2 under Description 13.)

The general landscape of the areas includes hilly to steep southerly slopes near the eastern extremity of the main range extending eastward from Dome mountain on the Richmond range. Drainage is into Wyndham Creek which feeds the Ricmond River via Eden creek.

Drainage line condition

Drainage lines are well defined and stable.

Aspect

Generally south and south west into Wyndham Creek.

Rockiness

There is no surface rock.

(f) Hydrology

The Planning unit lies in the drainage of Wyndham Creek within the Richmond River catchment and flows to the Richmond River via Eden creek. Drainage lines are well developed and initiate as drainage depressions from the main ridgelines and quickly become clearly defined, stable drainage lines. No swamps or wetlands are found within the net harvest area.
No major water storages are located within 100 metres of these compartments.
There are no prescibed streams in these compartments.

Representative water monitoring sites

Yet to be determined.

Reference Forest Planning Branch *Water quality monitoring program* SF NSW 1994

Previous harvesting

Toonumbar Plantation has an history of thinning from the late 60's to the present day. The Planning unit was generally last thinned in 1991-3. To date these compartments has had two thinnings.

Upstream catchment water use

Forestry. The compartment is in the top of the catchment.

Downstream catchment water use

Agricultural (cattle grazing and cropping) and domestic use.

Domestic water use

Whilst many people may pump from the Wyndham Creek for agricultural reasons, human consumption is typically based on rainwater.

(g) Vegetation and ground-cover See Descriptions 3-4.

Understorey comprises generally of lantana and scrubby species (estimated 90% of harvest area) together with an amount of tree litter and logging debris from previous operations.

Live ground-cover recovery within twelve months is anticipated provided normal seasonal rainfall conditions prevail. Because walkover timber extraction techniques will be used, disturbed areas will be minimal and are expected to achieve greater than 70% ground-cover re-establishment within twelve months.

(h) Proposed operation system See Description 5.

Use of existing plantation roads

Log haulage will be predominantly north-east to the Toonumbar Forest Road via the Summerland Way carrying Veneer and sawlogs to Kyogle. All these roads are permanently maintained roads and will require no upgrading or major maintenance.

Toonumbar Forest Road is a crowned gravel road following the ridge top of the Razerback Range. Road drainage is by way of 450mm pipes with sandbagged inlets and stable sandbag outlets.
Dumps K & Q are located adjacent to the Toonumbar forest road.
Trail road accesses dumps M,N & P servicing compartments 306, 307 & 316 .A stable natural earth crossing exists between dump N & M . This road surface is covered with grasses , crofton and various other weeds . Outfall drainage supplemented with rollover banks onto undesturbed vegetation. Maximum grade of Trail road is 5 degrees with maximum batter height 1 metre extending 50 metres. Batters are stable and well vegetated with grasses and weeds.

Dumps H,I & J are serviced by Ridge road which is a stable natural vegetated earth road with outfall drainage supplemented with rollover banks and mitre drains. Road grades in this section are less than 6 degrees. Dump L is located on 305 road approximatley 200 metres from Toonumbar Forest road. A natural earth road with grades no greater than 7 degrees drained by outfall, mitre and rollover banks. Two piped crossings exist on the lower catchment of this road . No trucks movements will be required along this section and it will be used as access for four wheel drives only . Dump G is situated on the contination of 305 road and logs will be trucked out via Plantation road. Plantation road is located on a native forest ridge line with a natural semi-gravelled surface utilising outfall drainage with mitre drain constructions. Maximum grade along this section does not exceed 8 degrees with maximum batters approximately 50 cms where they occur. Batter lengths are short where the road has cut through crests.

Roads 314 and Track service dumps A,B,C,D,E &F and will be hauled via Plantation raod to Toonumbar Forest road. Five approved crossing exist in this area . Crossing between dumps E & F are natural earth vegetated and stable . Gravelling will be carried out if conditions warrant additional stablisation of these crossings.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

All roads are well vegetated and show no signs of active erosion. Road grades do not exceed 10 degrees with the average grade of 5 degrees typical. Maximum batter heights do not exceed 1.5 metres where they occur. All batters are vegetated with grasses and various weeds.

Dump R is serviced by 304 road which passes through neighbouring compartments logged in recent times . 304 road is a natural earth/gravel surface with outfall drainage and pipe constructions. Road grades average 4 degrees with maximum batters of 4 metres, running for maximum lengths of 40 metres which are stabilised and adequately vegetated. Two approved pipe crossings are situated along 304 road with a log bridge crossing where it extends over the main filter strip. Inlets and outlets are stable and well vegetated with grasses & weeds.

Access 1&2 roads are four wheel drive roads and will not carry loaded trucks. Access 1 road has 6 piped crossings. Access 2 road has two natural crossings.
All internal plantation roads are existing permanent , well maintained stable surfaces with no signs of active erosion.
No new roading is proposed in connection with this harvesting operation. Pre-operational grading and patch gravelling will be undertaken where required.

Harvesting

The harvesting operation set out in Description 4 results in a cover factor **C = 0.065** in areas where a skidder is to be used.

Location of log dumps/log assembly areas

Logs dumps are located as indicated on the Harvesting Plan Operational Map. Log dumps must be drained using crossfall drainage and runoff from to dumps must not be discharged directly into drainage features or onto extraction tracks or snig tracks.
All dumps are situated to facilitate uphill snigging except at dump R, where downhill snigging is proposed measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the dump immediately before reaching it.
When snigging needs to cross a road to access a log dump all disturbance and damage to the effective drainage mechanisms must be repaired at the completion of snigging from that area.
Loading will be via excavator or forked loader.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description 7. Evaluation of soil and water data

(a) Soil Erosion & Water Pollution Hazard Categories

Soil Erosion & Water Pollution Hazard Categories for the harvest area have been assessed using SOILOSS 5.1. The rating has then been used to assess Soil Erosion & Water Pollution Hazard categories for the net harvest area for both forwarder and skidder operations.

Skidder (Used on areas 15° to 25° - Calculations taken for range 0° to 25°.)

SE&WPHR = R x K x LS x Cx P (5.1) where

R = 3320,

K = 0.03 **From soil survey**
S = slope **As factored in SOILOSS 5.1**
L = 20 metres
C = 0.065 **Plantation thinning with skidder**
P = 1.0 **Support Practice Factor**

Table 2 **Soil Erosion and Water Pollution Categories**

Slope Boundaries (degrees)	Water Pollution Hazard Rating	SE/WPH Category	Indicative % of Net Harvest Area	Erosion Hazard Class
0≤7	< 10	1	20	Low
>7 ≤ 30	11 - 49	2	80	Mod
>30	50+	3	n/a	High
Roads/tracks	High	3	n/a	High

Dispersibility

Proportion dispersible soil A horizon
B horizon
Method of determination D2 Not under laboratory conditions

Comment: The clay B horizon exhibited some dispersion in the E.A.T. Dispersible soil conditions will be adopted for this planning unit.

(b) Other factors

There are no other EHSCS/PCL factors which need to be considered in relation to the planned harvesting of the compartment.

References Standard Erosion Mitigation Guidelines for Logging in New South Wales Soil Conservation Service, CaLM, NSW 1993
Rosewall C.J. SOILLOSS A program to assist in the selection of management practices to reduce erosion Soil Conservation Technical handbook No.11 First Edition 1990, 2nd Edition 1993.

(c) Need for additional special conditions

Not applicable

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

FOREST ZONING AND SPECIAL ATTRIBUTES

Description 8 Forest zoning and Special Attributes

(a) Research plots

Research plots exist in compartments 308 & 316 , however they are no longer required and will be treated as the rest of the planning unit. Forteen Inventory Plots (14-25 , 42,43) are located within these compartments (see attached map). Plots are to be treated the same as the rest of the compartment and thinned to a residual basal area of 20 m^2.

(b) Special attributes of the area.

The area is classified "Native Species Plantation - General ".

A one hectare area adjacent to compartment 308 is classified PMP 1.4.7 " Flora Protection " . An endangered plant species *Corchorus cunninghamii* is found in this area.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Condition 3 AUTHORISATION

Condition 3.1 Area Identification

URBENVILLE DISTRICT
Toonumbar State Forest No. 343
1945-52 Age Class
Hoop pine
Compartment 305-309,314-316
Grevillia Management Area
Compartment details are included in attached Schedule (Appendix 1)

Condition 3.2 Authorisation

(a)

This Harvesting Plan is prepared by State Forests of New South Wales (State Forests) under the authority of the Forestry Act 1916. This Harvesting Plan is a condition of all Timber, Forest Products, Contractors and Operators Licences issued in connection with the timber harvesting operations described in the Plan.

(b)

All operations conducted under the authority of the Timber Licence and other licences and agreements issued for the area covered by this Harvesting Plan must comply with:

Licence conditions issued by State Forests under the Forestry Act 1916;

the " **Code of Logging Practice for Conifer Plantations** (1991);

the **"Standard Erosion Mitigation Guidelines for Logging in New South Wales" (SEMGL 1993)** issued by the Soil Conservation Service.

the conditions of **Pollution Licence No 4017** issued by the Environment Protection Authority under the Pollution Control Act 1970. Those general conditions which affect licensees are set out in Schedule "A" attached to every Timber, Contractors and Operators Licence. Where a Pollution Control Licence condition is more stringent than an equivalent in either of the other above-mentioned documents, the Pollution Control Licence condition must prevail.

conditions attached to any relevant licences issued by the National Parks and Wildlife Service under the Endangered Fauna (Interim Protection) Act 1992 and the National Parks and Wildlife Act 1967 (NPW Act);

conditions resulting from any relevant determination of an Environmental Impact Statement;

the regional silvicultural specifications applicable to this operation,

the schedule of specifications for the harvesting and utilisation of timber applicable to this operation, in this case, ***the NORPLY Wood Supply Agreement*** and subsequent amendmnets.

the Code of Procedure for the measurement of timber and other products applicable to this operation, in this case, ***the NORPLY Wood Supply Agreement*** and subsequent amendmnets.

c)
Variations, additions or amendments to the above documents may be made by the responsible authorities at any time , and must be implemented immediately by the State Forests licensee.

Condition 3.3 Environmental Planning & Assessment Act requirements

In preparing this Harvesting Plan, the requirements of Part V of the EPA Act (as amended) and Section 92 of the NPW Act have been considered and an Environmental Impact Assessment (EIA) has been prepared.

Condition 3.4 Breaches and infringements

Non-compliance with any condition or instruction set out in this Harvesting Plan will be dealt with in accordance with Section 3 of **the "Code of Logging Practice - Conifer Plantations"**. Serious breaches may lead to the issue of a Penalty notice, licensee suspension or prosecution.

Condition 3.5 Variations and amendments to this Harvesting Plan

Conditions and requirements of the Pollution Control License cannot be varied in the field without prior written approval from the EPA , other than those areas detailed in condition 5.1 (c).

Variations and other specified approvals detailed in Condition 5.1 (c) , may be made by the Supervising Forest Officer to this Harvesting Plan , subject to the District Forester's counter approval.
Other approvals may be only be made by the Supervising Forester and also subject to the District Forester's counter approval , and where relevant to the Pollution Control Licence , with prior approval from the EPA.

All approvals must be recorded on a variation advice , attached as Section 6 to all operational copies of this Harvesting Plan.
This Harvesting Plan must not be amended by a licensee or contractor.

Condition 3.6 Harvesting Plan availability

Copies of this Harvesting Plan must be held available by the licensee or contractor at the site of harvesting operations at all times that felling, extraction or environmental work is being undertaken within the area covered by this Harvesting Plan.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

CERTIFICATION

Condition 3.7 Plan Preparation (by Forester, Forest Assistant)

Prepared by ....**K .W .PETTY**.....Signature.....

Title ....**A/Marketing Forester** .....Date.....**16th.December 1996**.....

Condition 3.8 **District Approval** (by District Forester)

I approve the issue of this Harvesting Plan subject to any amendments, endorsements or approvals that may be made following submission to the Environment Protection Authority.

The date that operations will need to commence is ..**13th JAN 97**.....

Signature.....District Forester. Date.....19/12/96.....

This Harvesting Plan is approved without amendment/subject to the amendments detailed in the covering letter/document attached. (To be completed by person who originally prepared the Plan who must attach the relevant amendments to the Plan.)

Signature .....Position .....Date.....

Authority (EPA) .....

Signature .....Position .....Date.....

Authority (Other) .....

I note approval of this Harvesting Plan from the above-mentioned authority, together with the amendments they have required to be included in the Plan.

These amendments have been included in the final Plan. This Harvesting Plan comprises pages 1 - 37 attached and the Operational Map marked and referenced to this Harvesting Plan. This is Harvesting Plan No GMA CUT1/96

Signature .....District Forester Date.....

Condition 3.9 **Date for commencement of operations.....JAN 1997.....**

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

DISTRIBUTION

Condition 3.10 *(Schedule to be attached to each copy and highlighter marked to recipient)*

One copy of the plan is required in each case unless otherwise noted.

Timber Licensee	Parts 1,3,4
Contractors	Parts 1,3,4
Operator(s) (where required)	Parts 1,3,4
Supervising Forest Officer(s) (SFO(s))	Parts 1 ,3-5 , (2 optional)
Supervising Forester(s)	All Parts
District Forester	All Parts
District Office Register	All parts
Compartment History File	All Parts
Regional Office (optional)	All Parts
Soil Conservationist (Forestry)	All Parts
Forest Planning Branch, Head Office, for distribution to:	
Environment Protection Authority	All Parts (2 copies)

Condition 3.11 INDUSTRY FIELD SUPERVISORS/BUSH SUPERVISORS ACKNOWLEDGEMENT

I acknowledge that I have received a copy of Harvesting Plan No GMA CUT1/96 and that I understand the Conditions of the Plan as explained to me by a State Forests officer.

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Condition 3.12 Industry endorsement

This Plan has been signed and endorsed on behalf of industry prior to commencement of operations.

Signature .....Position.....Date .....

HARVESTING PLAN
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HARVESTING PLAN
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Condition 4 OPERATIONAL CONDITIONS

Condition 4.1 Harvesting Activity Description

Third thinning of thinned 1945-52 Age Class *Auracaria Cunninghamiana* stand to a residual basal area of $20m^2$ /hectare.

Condition 4.2 Tree-marking and Harvest Regulation

Tree-marking colour	2 Pink lines	= Trees marked for retention and not to be damaged.
	Pink Dot	= Trees marked for removal
Area Marking colour	Blue	= Compartment boundary
	Pink 'D'	= Log dump site
	Orange	= Road or track location

Condition 4.3 Order of Working

(a) Wet weather (winter), dry weather (summer) and intermediate harvesting areas

Wet weather, dry weather and intermediate weather areas allocated for harvesting are shown on the Plan Map. These areas must be harvested in accordance with seasonal conditions unless otherwise approved by the SFO.

(b) Wet weather controls -roads

During wet weather, the wet-weather controls set out in Section 8 of the Code of Logging Practice will apply. In particular, where runoff occurs from a road surface, haulage may not occur unless the road is agravel or sealed road.

(c) Wet weather controls - timber extraction and skidder snigging

During wet weather, timber extraction tracks and snig tracks must not be used where:

(i) there is runoff from the track surface or;

(ii) there is a likelihood of significant rutting leading to turbid runoff from the track surface .

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Condition 4.4 Application of erosion and water pollution control Conditions

(a) Basic Water Pollution Categories

Table 3 Soil Erosion and Water Pollution Categories

Slope Boundaries (degrees)	Water Pollution Hazard Category	SE/WPH Category	Indicative % of Net Harvest Area
0≤7	LOW	1	20
>7 ≤ 30	MODERATE	2	80
>30	HIGH	3	n/a
Roads/tracks	HIGH	3	n/a

The SFO is responsible for identifying ground slopes exceeding 30 degrees in the field.

(b) Approved timber harvesting and extraction method

Mechanised felling/processing/bunching;

Extraction by wheeled skidder . Extraction outrows must not be parallel to/& immediately adjacent to the filter strips. No box cuts are to be used.
Walkover extraction must be used wherever practicable in preference to snig track construction.
Snig tracks must not be located or constructed where they cannot be drained effectively.
Topsoil diturbance must be minimised during snig tarck construction, where sidecut construction is not required. Blading-off on snig tracks is not permitted.
Snigging along roads must only occur in order to avoid snig track construction and where approved by the SFO. Effective road drainage must be re-instated immediatley at the completion of the snigging operation.
All snigging will be uphill .
Dumps will be drained by crossfall drainage.

Haulage involving the use of existing natural surface roads and gravelled roads as shown on the Map. Log stockpiles and loading areas are indicated on the Map.

Harvesting operations may be conducted throughout the year subject to the application of normal wet weather closure procedures and restriction to wet weather areas as set out in Condition 4.4.

c) Slope limits for the area

No restrictions. All areas are available for harvesting.

(d) Drainage feature protection

Water courses and drainage lines must be protected by filter strips, in accordance with Table 4.

Table 4 Filter strip widths

		DRAINAGE FEATURE		STRIP WIDTH EITHER SIDE
SE/WPHC	**WPHC Slope**	**Catchment**	**Slope**	**Filter**
	(degrees)	(hectare size)	(degrees)	(metres)
1	≤ 5	< 40	-	5
2	> 5 to ≤ 23	< 40	-	10
3	> 23 to 30	< 40	< 18	15
3	>23 to 30	< 40	**greater > 18**	20
1-3	0 - 30	**greater >40**	< 18	20
1-3	0 -30	**greater > 40**	**greater > 18**	30

Buffer strips must be 5m wide on each drainage depression
NOTE: The widths above equal or exceed the requirements of PCL No 4017

Filter strips are indicated on the Plan Map.

Filter strips will be 5 metres wide for WHPC 1and 10 metres wide for WHPC 2, except for areas over 18° slope operated by skidders where they will be 20 metres wide.
The width of filter strips on watercourses, prescribed streams and drainage lines must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

Filter strips will not be marked in the field as trees will be marked for removal. **It is the contractor's responsibility to observe the correct distance from drainage lines and watercourses for filter.**

It is also the contractors responsibility to identify the 5 metre zone within the filter strip.

Drainage depressions

Buffer strips must be provided along all drainage depression within the planning units. Buffer strips must be 5 metres wide each side of the drainage depression.
Machinery must not operate in buffer strips when the soil is saturated.

Machinery operating within buffer strips must :

a) minimise soil exposure ; and
b) not cause channelised flow.

This must be achieved by :

a) the use of walkover techniques wherever possible; and
b) preventing sewing of machinery tracks; and
c) operating with the blade up at all times; and
d) not snigging along drainage depressions.

No earthworks can be undertaken within buffer strips except for the construction of road, extraction track or snig track crossings.

The width of buffer strips on drainage depressions must be measured from the apparent centre of the drainage depression.

It is the contractor's responsibility to identify plantation drainage depressions encountered in the field.

(e) Operational Protection

Felling and extraction in filter strips

Trees may be felled within a filter strip where they form part of the plantation and where it is necessary to avoid later windthrow, or where it is necessary for the construction of road, extraction track or snig track crossing structures.

Where necessary to avoid later windthrow, the following must apply :

a) trees may be felled into watercourses. In such cases, crowns, logs and substantial debris (*greater than 100mm in diameter & 3 meters in length*) resulting from logging must be removed with the minimal disturbance to the bed and banks, unless removal would result in more damage to the bed and banks than non-removal. Instances where crowns, logs, or substantial debris are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for doing so.

b) trees may be felled into drainage lines, wetlands or swamps, in which case crowns and logs of felled trees must be removed with minimal disturbance to the bed and banks, unless removal would result in more damage than non-removal. Instances where crowns and logs are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for doing so.

c) machinery may enter a filter strip on a watercourse, drainage line, swamp or wetland to fell or extract felled trees, providing it does not enter the five metre zone and soil disturbance is minimised.

Soil disturbance must be minimised by the following techniques:

(i) maximum use of skidders and minimal use of tracked machine;

(ii) minimal use of blades;

(iii) use of slash to protect the soil during extraction;

(iv) minimise skewing on tracks;

(v) deliberate spreading of slash over disturbed areas at the completion of extraction in each section.

Machinery other than felling machinery must not enter the five metre zone, except for the construction and use of approved road, extraction track or snig track crossings.

Two approved snig track crossings are situated in cpt 315 to facilitate extraction to dump R. Pipes &/or hollow logs will be used during logging with the structured removed following harvesting: Measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the crossing immediately (10 metres of undisturbed sediment filter is required) before reaching it.

Felling and extraction in drainage depression buffer strips

The measures described in (i) to (iv) above must be used to minimise soil disturbance in buffer strips. In addition, no snigging along drainage depressions is permitted.
Refer to section 4.4(d) for measures to minimise soil disturbance.
Slash must be placed in drainage depression crossings and should be left in situ at the completion of operations.
It is the contractor's responsibility to identify plantation depressions buffer strips encountered in the field.

Track drainage

Sections of extraction tracks and snig tracks must be progressively darined at the completion of logging operations around each section of track, using one of the following techniques, or a combination thereof :

a) existing ground cover must be retained as far as practicable. Where this prevents concentrated water flow in excess of the distances specified in Table 5, constructed drainage is not required; or

b) slash and logging debris must be retained as far as practicable. Where retained slash will prevent concentrated water flow in excess of the distances specified in Table 5 and no post logging burning is planned, constructed drainage is not required; or

c) outfall drainage must be used as far as practicable. Where outfall drainage will prevent concentrated flow in excess of the distances in Table 5, constructed drainage is not required.

Table 5 : Maximum Spacing of Extraction/Snig Track Drainage Structures (metres)

Track grade (degrees)	Water Pollution Hazard Category		
	1	2	3
5	200	150	100
10	150	100	60
15	80	60	40
20	60	40	25
25	40	30	20
30	30	25	15
35	25	20	10

Snig track and extraction track drainage structures must be designed to:

a) have sufficient capacity to convey the peak flow from a 1:2 year storm event; and

b) divert water onto stable surfaces; and

c) minimise the unchecked flow of water directly into watercourses and drainage lines or onto roads and log dumps; and

d) divert water at a velocity which minimises damage to the structure.

Outfall drainage, crossbanks, mitre drains and sediment sheeting will be used to achieve the required outcomes stated above.

Where crossbanks are used they must be constructed to a minimum unconsolidated effective height of 35cm, or a consoildated effective bank height of 25cm, unless otherwise calculated in accordance with the above.
Crossbanks must not be constructed of bark.

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Drainage must be effected as soon as practicable at the completion of operations on each extraction track or snig track, and in any event within 2 days, unless soil conditions preclude construction of effective drains or would lead to increased soil erosion. Instances where the drainage is not effected within two days of the completion of logging operations must be documented on the SFO's copy of the harvesting plan, including the reasons why.

The number of snig tracks or extraction tracks open at any one time must be kept to a minimum.

Drainage must be effected if the use of an extraction track or snig track is to be temporarily discontinued in accordance with Table 6:

Table 6: Drainage of Extraction Tracks and Snig Tracks at Temporary Cessation of Operations

Water Pollution Hazard Category	Monthly Rainfall Erosivity Rating	# of Days
1	N/A	10
2	<900	8
	>900	5
3	<900	5
	>900	3

Snigging and timber extraction must occur in an uphill manner unless downhill snigging maintains or decreases the potential for water pollution, or unless phsyical constraints preclude uphill extraction.
Where downhill snigging is proposed, one of the following techniques or a combination thereof must be used:

a) downhill snig tracks must enter the log dump from the side or below;

b) a drainage structure must be in place immediately before a snig track enters the log dump, at the end of each day's operation.

Roads

No construction of new roads is permitted under this Harvesting Plan.

Roads must be drained during and upon completion of logging operations.
Road drainage structures must be located, constructed and maintained in such a way that they will:

a) have sufficient capacity to convey the peak flow from a 1:5 year storm; and

b) minimise the unchecked flow of water from onto extraction tracks, snig tracks or log dumps; and

c) not discharge water from table drains directly into watercourses, drainage lines, wetlands or swamps, by draining the road at the first opportunity from the drainage feature and at least within the spacings of Table 5 for WPHC 3.

d) divert water onto stable surfaces capable of handling concentrated water flow and which provide for efficient sediment trapping by using one of the following techniques, or a combination thereof:
(I) diverting flow onto undisturbed vegetation;
(ii) diverting flow onto slash and logging debris;
(iii) installing natural or artifical sediment barriers below drainage structures.

Where water diverted by a drainage structure discharges onto a batter of greater than one metre in height, a drop down structure and dissipater must be used.

Road drainage must be designed and maintained to prevent erosion of the road surface using one of the following techniques, or a combination thereof:

a) outfall drainage;

b) relief pipes or mitre drains spaced at intervals according to figure 1, with a minmum spacing of 20 metres.

c) cross banks constructed to a minimum unconsolidated effcetive height of 35cm, or a consolidated bank height of 25cm, unless otherwise calculated in accordance with the above conditions at maximum spacings in accordance with Table 5 for WPHC 3;

and any other techniques that are required.

Windrows must be removed from the shoulders of all roads unless specifically constructed to prevent erosion of fill batters or where infall drainage is used. Where it is not possible to remove windrows they must be cut through at regular intervals, equivalent to a maximum of two-thirds the distances required for drainage structures.

Blading-off of roads may be permitted only where damage is minimal and subsequent drainage and repair is possible.

Each blading-off operation must be approved by the SFO. Where blading-off occurs, the material removed must be placed on a recoverable position and replaced once the logging operation is completed.

Location of log dumps/log assembly areas

Logs dumps are located as indicated on the Harvesting Plan Operational Map.
Log dumps must be located out of filter and buffer strips. Debris from log dumps must not be placed in, or within 10 metres of, filter strips.
Any runoff drainage from log dumps during and upon completion of logging operations must be dispersed onto stable surfaces, and not discharged directly into watercourses or drainage lines or onto extraction tracks or snig tracks.

Upon completion of operations the log dump surface must be left in a stable condition by using one of the following techniques or a combination thereof:

a) retaining a 70% cover of logging slash;

b) seeding the log dump with a cover crop, 20kg/ha.

Logging operations by wheeled loaders and trackscavators must cease where there is runoff from the log dump surface.

Condition 4.5 Research and Inventory Plots

Forteen Inventory Plots 14-25, 42,43 exist in the planning unit. **Tree measurements must be recorded by the SFO before and after thinning on the sheets provided.**

Condition 4.6 Modified harvest conditions for special emphasis areas

(a) Native forest retention area

Not applicable.

(b) Boundary fences

Care must be taken not to fall trees over the boundary fences which are indicated on the Plan Map. Fences must be repaired immediately if damage results. Tree/slash falling adjacent to fence lines should be removed for a distance of 1.5 metres on either side.

(c) PMP 1.4.7 Flora Protection

A threaten species ***Corchorus cunninghamii*** is located adjacent to compartment 308. An area of one hectare is shown on the attached maps. Logging in this area is unlikely to significantly impact on this species. Ground disturbance will be kept to a minimum and all trees must be directed out of this zone. **The SFO is responsible for identifying and marking this zone in the field.**

(d) PMP 1.4.4 Research

Research plots are located in compartments 308 & 316 . These plots are no longer required for research purposes and should be treated the same as the remainder of the planning unit.

Condition 4.7 Specification of type of products to be removed.

Product 1 **Veneer**
- Minimum length 2.7 metres
- Minimum diameter 20 cm small end under bark
- Minimal sweep and bend

Product 2 **Sawlog**
- Minimum log length 2.4 metres
- Minimum diameter 14cm small end under bark
- Minimum diameter 20cm large end under bark
- Logs not meeting veneer specifications are available as sawlogs.

Condition 4.8 Yield information for planning unit GMA CUT1/96

CPT	Area (ha)	Age class	Op BA (m^2)	Veneer (m^3)	Sawlog (m^3)
305	11.6	1945	44.8	**1682**	**297**
306	12.8	1946	42.5	**2011**	**223**
307	6.6	1946	45.4	**1141**	**127**
308/1	8.7	1947	46.9	**1357**	**151**
309/1	5.9	1947	45.1	**871**	**97**
314	13.2	1950	41.5	**2674**	**297**
315	5.8	1950	42.4	**510**	**170**
316	8.5	1952	43.1	**1248**	**139**

Product 1	Veneer	11494 cubic metres
Product 2	Sawlog	1501 cubic metres

Condition 5 INSTRUCTIONS TO SUPERVISING FOREST OFFICERS (SFOs)

Condition 5.1 SFO' authority to supervise harvesting operations

(a) General

The Supervising Forest Officer responsible for the direct field supervision of this harvesting operation, including tree-marking, log measuring and/or log check measurement, safety, implementation of wet weather controls, and monitoring and reporting generally will be:

The Plantation Marketing Foreman, Toonumbar SF.

The intention is that an individual Marketing Foreman will be responsible for the entire operation within the compartments from commencement to completion.

(b) Relieving SFOs

Relieving SFOs, if required, will be:

The Acting Plantation Marketing Foreman, Toonumbar SF,
The Forest Assistant (Marketing) Urbenville District,
The Marketing Forester, Urbenville District.

(c) SFOs authority

The SFO has authority to approve:

(a) the blading off of natural surface roads provided that damage will be minimal and the removed material is recoveralbe for respreading;

(b) downhill snigging routes where provided for in the Harvesting Plan;

(c) use of natural surface roads for snig track crossings or as snig tracks or timber extraction tracks to dumps provided restoration of the road for wheeled traffic is undertaken as necessary and use of the road significantly reduces soil distrubance;

(d) the exact field location of topsoil stockpiles for later recovery use;

(e) the exact location of log dumps commensurate with the operational Map;

(f) the exact location and type of drainage line crossings for snig tracks.

All approvals must be noted on a Harvesting Plan Variation Form and copies attached to the relevant master copies of the Harvesting Plan.

Condition 5.2 Tree-marking and other harvesting control requirements.

Tree marking

Tree-marking colour	2 Pink lines	= Trees marked for retention and not to be damaged.
	Pink Dot	= Trees marked for removal
Area Marking colour	Blue	= Compartment boundary
	Pink 'D'	= Log dump site
	Orange	= Road or track location

The SFO will supervise and direct the sequence of logging and will mark trees for removal.

Filter strips will not be marked in the field , but it is the responsibility of the contractor to identify the 5 metre zone within the Filter.
Filter strips will only be marked in the field where it is necessary to convey a particular message to an operator which cannot be done verbally or in the tree marking for removal strategy. Where marking is used the SFO is responsible for marking filter strips in the field progressively and prior to the commencement of operations into that section of the harvest area.

Contractors and operators are responsible for identifying drainage depressions encounted in the field and taking appropiate protective action within the buffer strip area whilst operating or tranversing the drainage depression.

Condition 5.3 Monitoring and reporting

Daily and Fortnightly reporting

The standard Regional procedures for daily and fortnightly reporting on the conduct of operations must be followed.

The SFO must report the following matters and record their location if necessary on their copy of the Plan Map , Breach Report Form, and the recording map attached to the Plan for that purpose:

(i) instances where trees and/or crowns are not removed from drainage lines

(ii) instances where machinery enter the 5 metre internal filter strip zone other than those specified in the plan.

(iii) instances where slash crossings are left in situ;

(iv) instances where the track drainage is not affected within 2 days of completion of operations.

(v) non-compliance with any PCL or Forest Practices code conditions relating to any Licenced State Forest Logging operation.

Condition 5.4 Other instructions

There are no other special instructions concerning harvesting supervision.

Condition 5.5 SUPERVISING FOREST OFFICERS ACKNOWLEDGEMENT

I acknowledge that I have received a copy of Harvesting Plan No GMA CUT1/96 and that I have been briefed on the Conditions of the Plan and the supervision and operational control requirements as explained to me by the District Marketing Forester.

Signature .....Date .....

Position.....
Supervising Forest Officer

Signature .....Date .....

Position.....
Relieving Supervising Forest Officer

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HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
C 42	Representative water monitoring site	Yes	D6(f)
	Have the Water Pollution Hazard Categories (WPHC)s and the Proportion of Dispersible Soil (PDS) been calculated for the area?	Yes	D7(a) C4.4 (a)
	Method for soil sampling for K factor	Yes	D6(d)
	Field sampling - sites?	Yes	Map
	- lab analysis?	Yes	
	- field analysis?	Yes	
1b	Site specific conditions	No	D7(c)
4.	Are areas >30° outside net harvest area?	Yes	Map C4.4(c)
5.	Are areas in WHPC4 outside net harvest area?	Yes	Map C4.4(c)
6.	Drainage feature & protection	Yes	D6(f) C4.4(d) C4.8(g)
7.	Any major water storage?	No	D6(f) C4.4(d)
8.	DDBS conditions included?	Yes	C4.4(d)
9.1(c)	Filter strip on Map?	Yes	Map
10.	Conditions for marking/ identifying:		
	- filter strips	Yes	C4.2 C4.4(d)
	-buffer strips		C4.4(d)
	in the field		C4.4(d)
13.	Reporting accidental felling into filter strips	Yes	C5.3
14.,20.,22.	See 10		
24.	Specify techniques in DDBS	Yes	C4.4(e)

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POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
47.	Road design, etc. for 1:10 yr. storm event: What techniques for 12 month stabilisation?	Yes	D6(h) C4.4(f)
48.	Are roads shown on Map?	Yes	Map
49.	If road traverses area over 30° what techniques for 1:10 storm event?	No	D6(h)
	What techniques for 6 month stabilisation of road?	No	D6(h)
50.(a),(b)	What is maximum road grade?	Yes	C4.4(f)
51.	Who will mark roads in field?	Yes	C4.4(f)
52.	What is maximum clearing width for road formation?	Yes	C4.4(f)
53.	Is any roadside clearing proposed? If so what techniques for 70% ground-cover within 12 months?	No	D6(h)
57.	Any borrow or gravel pits? If so what batter and stabilisation techniques are required?	No	D6(c) C4.4(f)
60.	What design criteria for stable road batters within 12 months?	No	C4.4(f)
63.	Do road drainage techniques specify - peak flow 1:5 year storm capacity? - stable surface water diversion? - minimisation of unchecked flow? - use of sediment traps if necessary?	Yes	C4.4(f)
64.	What is spacing and type of road drainage structures?	Yes	C4.4(f)

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POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
65.	Is an alert condition needed for cutting of roadside waterholding windrows?	No	
66.	Is an alert condition needed to emphasise 2 day removal of debris from drainage structures?	No	
67.	Is an alert condition needed for reporting of blading off approvals?	No	
71.	Are drainage feature crossing structures for roads specified for location, type and capacity?	Yes	C4.4(f)
74.	Is a report condition included to cover spoil non-removal from drainage features?	Yes	C5.3(c)
76.	Is a report condition included to cover reporting that crossing stabilisation is not completed within five days?	Yes	C5.3 (c),.
77.	Are techniques listed to leave crossing sites stable?	Yes	C4.4(c)
78	Are techniques specified for stabilisation of roads that are no longer required?	Yes	D6(h), C4.4(f)
79.	Have any old roads been evaluated?	No	D6(h)
80	Are alert conditions required for dispersible soils?	No	D13(a)
81.	Are protection techniques spelt out for roads traversing dispersible soils?	No	

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Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
82.	Are alert conditions for wet weather restrictions included for roads?	Yes	C4.3(b)
83.	Is a report condition included to cover crossing stabilisation not being completed within 5 days?	Yes	C5.3
84.	Are techniques listed to leave crossings stable?	Yes	C4.4(e)
85.	Is a report condition needed to cover none removal of temporary crossings?	Yes	C5.3
86.	Are there any crossings of drainage features other than drainage depressions by extraction tracks?	Yes	C4.4(e) C5.1
	Are extraction track crossing locations type and capacity specified?	Yes	C5.1
	Is a reporting condition included for SFO approvals for crossings?	Yes	C5.1(c)
	is a report condition included for non-removal of spoil from drainage features?	Yes	C5.3
89.	What conditions are specified for effective extraction track drainage?	Yes	C4.4(e)
92.	Is an alert condition needed for timber extraction along roads?	No	
93	Are alert conditions for wet weather restrictions included for timber extraction tracks?	Yes	C4.3(c)

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HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
99	Do specifications for drainage of timber extraction tracks include: - capacity for peak flow in a 1:2 year storm event? - diversion onto stable surfaces? - minimise unchecked flow into drainage features? - divert water at minimum damage to structure?	Yes	C4.4(e)
103.	Is minimum specification for bank height used?	Yes	C4.4(e)
105.	Is a reporting condition needed for non-drainage of timber extraction tracks over two days after use has ceased?	Yes	C5.3
107.	Is an alert condition for temporary cessation of use drainage condition required?	No	
112	Is timber extraction being undertaken on dispersible soils?	No	D6(d) D7(a)
	If so, have alert conditions have been included?	No	
119	Have specifications for log dump location and drainage been included?	Yes	C4.8(h)
120	Is an alert condition for the use of traxcavators and wheeled loaders in relation to wet weather necessary?	No	

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POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
	What other conditions listed in Sch 2 Div 3 need to be included as alert conditions in this Plan?	None	
	Are any appendices required?	No	

HARVESTING PLAN
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NOTES

Copies of variations and approvals which apply to this Plan should be attached here.

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(GREVILLIA MANAGEMENT AREA -Northern Region)

CLEARANCE CERTIFICATE

HARVESTING PLAN No. ...GMA CUT1/96.....

TOONUMBAR..STATE FOREST.....URBENVILLE..DISTRICT

To M.....Supervising Forest Officer

I request approval for me to move my logging crew and all associated machinery from the above mentioned area to the next Planning Unit in accordance with Section 3.5 of the Code of Logging Practice.

I certify that:

(a) all permanent roads, trails and mitre drains have been cleared of harvesting debris;
(b) butt damage to retained trees has been kept to acceptable limits;
(c) all trees marked for removal have been felled;
(d) utilisation limits have been satisfactorily met;
(e) stump heights conform to requirements;
(f) all hanging trees have been felled and brought down;
(g) all log dump sites/landings/log stack sites have been satisfactorily restored as required;
(h) harvesting debris is not accumulated around retained trees;
(I) all accumulated litter has been disposed of properly;
(j) all filter, protection and buffer strip requirements have been complied with;
(k) all snig track, extraction track and temporary logging road drainage has been installed satisfactorily and other required rehabilitation work has been completed;
(l) all necessary repairs to damaged roads, signs, fences and other structures have been carried out.

I believe that I have met all my obligations under the conditions of the Timber Licence, the Pollution Control Licence, and/or any licence issued under Section 120 of the National Parks and Wildlife Act, which apply to the Compartment (Section, Coupe) just completed , as stated in this Harvesting Plan.

Signature.....Licence No.....Date .....
Contractor/licensee

As a result of inspections of the logging operations made in accordance with this Harvesting Plan, I am satisfied that, to the best of my knowledge, the licensee/ contractor responsible for this harvesting operation has satisfactorily completed all work and approval is given for her/him to remove her/his machinery and equipment and leave the area/ commence operations in another Planning Unit.

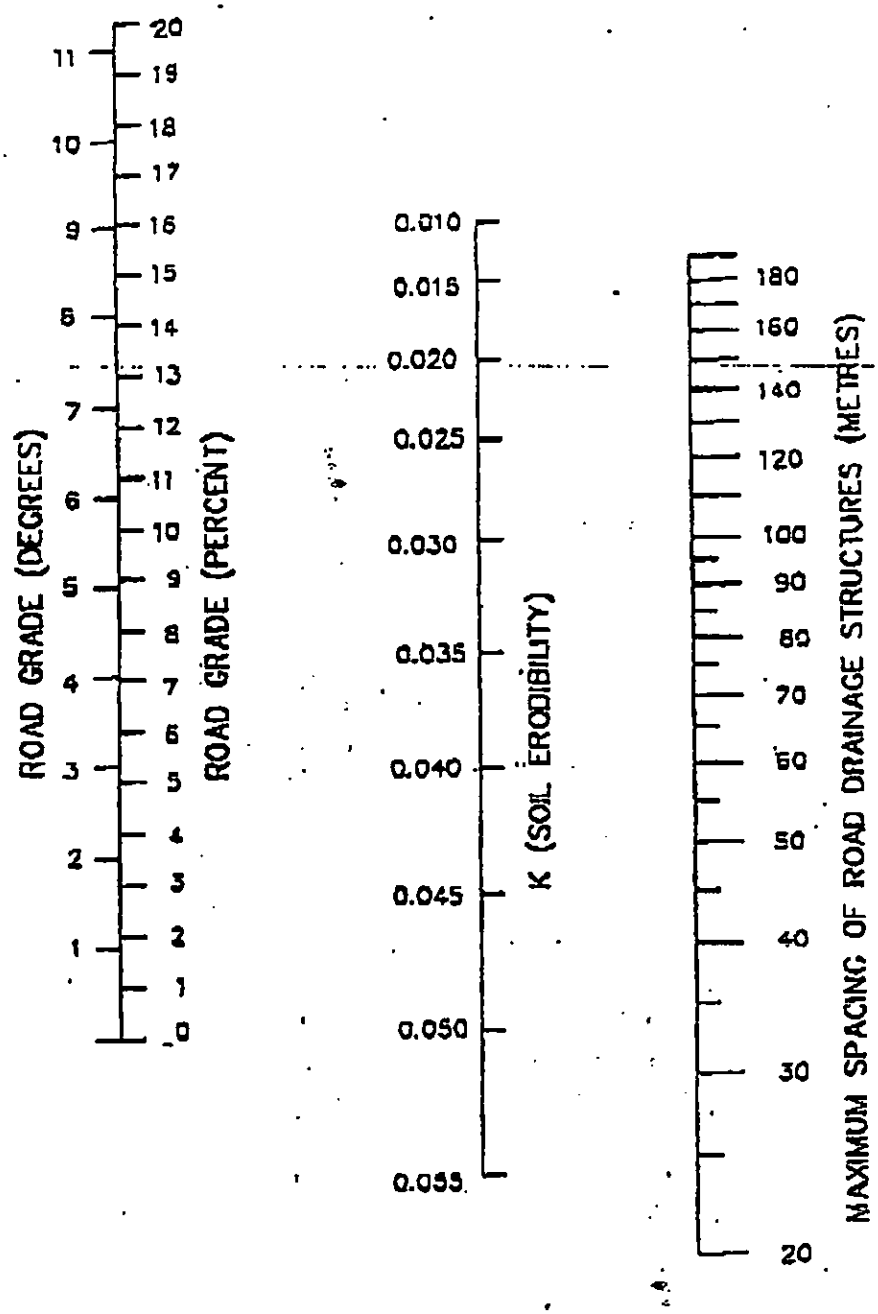
This clearance does not release the licensee/contractor from any obligation to undertake any remedial work if subsequent deficiencies are found during any inspections of the area made within 12 months of the date of this post- harvesting inspection.

Last inspection was made on .....(Date)

Signed .....(Date).....

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

FIGURE 1 (SCHEDULE 4)



NOTE: SPACING NOT TO EXCEED 180 METRES

FOR SPACING LESS THAN 40 METRES, DRAIN PROTECTION SHOULD BE INVESTIGATED.

SPACING OF ROAD DRAINAGE STRUCTURES TO PREVENT DRAIN SCOUR

DRAWING NO. SEMGL 02

SOIL SURVEY - TOONUMBAR STATE FOREST TOONUMBAR PLANTATION (18/7/96)

SITE	GRID REF.	LANDFORM	SLOPE (deg)	DEPTH (cm)	HORIZON	TEXTURE	COLOR	pH	E.A.T.	K FACTOR
1	490850E	CREST	1	0-25	A	LC	5YR3/2	6	8	0.025
cpt 308	6846850N			26-70	B	LMC	10YR5/4	5	1(2)	0.018
2	490600E	LOWERSLOPE	21	0-10	A	LC	5YR3/2	6	8	0.025
cpt 310	6845750N			11-60	B	LC	7.5YR3/2	6	8	0.025
3	490400E	MID-SLOPE	8	0-10	A	CL	5YR2.5/2	8	8	0.03
cpt 311	6845850N			11-60	B	LC	5YR3/3	5.5	4-6	0.025
4	490150E	MID-SLOPE	3	0-35	A	LC	10Y2.5/1	7.5	8	0.025
cpt 313	6846700N			35-70	B	CL	10YR7/2	6	4-6	0.03
5	490400E	LOWERSLOPE	6	0-15	A	CL	5YR2.5/2	7.5	8	0.03
cpt 305	6847350N			16-70	B	HC	5YR3/1	5	8	0.012
6	491200E	LOWERSLOPE	16	0-20	A	CL	5YR3/2	7	8	0.03
cpt 302	6847100N			20-70	B	MC	7.5YR4/4	7	2	0.015
7	490800E	MID-SLOPE	5	0-10	A	CL	5YR2.5/2	6	8	0.03
cpt 304	6847200N			11-50	B	LC	2.5YR3/3	6	4-6	0.025
8	491050E	MID-SLOPE	6	0-10	A	LC	5YR3/2	6.5	8	0.025
cpt 307	6847850N			11-55	B	HC	7.5YR4/3	4.5	2	0.012
9	489500E	CREST	3	0-10	A	LC	7.5YR2.5/1	7	8	0.025
cpt 316	6847800N			11-45	B	HC	5YR3/2	6.5	4-6	0.012
10	490950E	CREST	4	0-15	A	CL	5YR3/2	6.5	8	0.03
cpt 301	6848050N			16-65	B	LC	5YR3/3	6.5	4-6	0.025

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA - Northern Region)

RECEIVED
31 JAN 1997

1123
NORTH
31/1/97

Previous Register #1100.

Harvesting Plan No GMA CUT1/96

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HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Condition 2 FOREST MANAGEMENT & ENVIRONMENTAL CONSIDERATIONS

NATURAL AND ARTIFICIAL PHYSICAL FEATURES

Description 1 Physical description of the area

STATE FOREST	Toonumbar No. 343	**DISTRICT**	Urbenville
REGION	Northern	**AGE CLASSES**	1945-1950
COMPARTMENTS	305-309, 314-316	**PLANNING UNITS**	GMA CUT1/95
THINNING STATUS	THIRD THIN		

The area consists of 73.1 hectares (nett) of Hoop pine plantation established in 1945 to 1952. Elevation is 280 -340 metres asl. The Toonumbar Pine Plantation occupies hilly to steep southerly slopes near the eastern extremity of the main range extending eastward from Dome Mountain on the Richmond Range. Drainage is into Wyndham Creek which feeds the Richmond River via Eden Creek. A filter strip forms the boundary on the southern edge. No other major water courses transverse the planning unit. There are no unusual physical or artificial features in the area. (See also Description 12.)
See attached Harvesting Plan Operational Map and the Locality Map.

Description 2 Special warning of critical boundaries or non-harvest areas

Boundary lines are clearly marked by roads and a major drainage line in the south of the Planning unit as indicated on the Harvesting Plan Map.

FOREST MANAGEMENT AND SILVICULTURAL OBJECTIVES

Description 3 Forest Crop Types

Auracaria Cunninghamiana (Hoop pine) scheduled for third thinning.

- First thinned (T1) in 1970's - 80's to a basal area of ca. 31-38m²/ha.
- T2 in 1991-3 to a basal area of approximately 32-37m²/ha.
- Basal area at present averages 44 m²/ha
- **Target basal area for the planning unit is 20m²/ha**

Description 4 Endangered flora and fauna.

An endangered plant *Corchorus cunninghamii* occurs in a 1 hectare circle adjoining compartment 308. There are no known endangered fauna (Schedule 12) species found in this part of Grevillia Management Area .

References Austeco work for Urbenville EIS 1993, NPWS North East forests Biodiversity Study 1991/93, Forestry recordings (Foresters and Employees)

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description 5 Harvesting Method

Harvesting aims to thin to a residual basal area to 20m^2 /hectare. It is anticipated that this Third thinning operation will yield 11494m^3 of veneer and 1501 m^3 of sawlog being broken into the following:

CPT	Area (ha)	Age class	Op BA (m^2)	Veneer (m^3)	Sawlog (m^3)
305	11.6	1945	44.8	1682	297
306	12.8	1946	42.5	2011	223
307	6.6	1946	45.4	1141	127
308/1	8.7	1947	46.9	1357	151
309/1	5.9	1947	45.1	871	97
314	13.2	1950	41.5	2674	297
315	5.8	1950	42.4	510	170
316	8.5	1952	43.1	1248	139

The harvesting method comprises:

Ground based mechanised felling/processing at stump, maximising utilisation;

Extraction by a wheeled skidder and a tracked machine on steeper slopes. Walkover extraction will result in minimal soil disturbance on extraction tracks;

Debarking , sorting and loading will be carried out by a tracked excavator with a log clamp;

Haulage involving the use of existing natural surface roads and gravelled roads as shown on the Map. Log stockpiles and loading areas ,(Dump sites) are marked on the map and will be used as directed by the Supervising Forest Officer.

EROSION AND WATER POLLUTION CONTROL STRATEGY

Description 6 Site soil and water data and other information

(a) Location See Map

(b) Climate

Rainfall

Average annual rainfall is 1300mm p.a. Rainfall shows a marked monsoonal influence and is characterised by periods of intensive precipitation from cyclonic activity in the summer months compared with relatively dry periods in winter and spring.

Annual rainfall erosivity for the area **R = 3320**. Monthly maximum erosivity occurs during **January, R = 664.**

Temperature

Mean temperatures for Roseberry Park, 3 km to the north of Toonumbar SF are summer 18 -29 ° and winter 4 - 19°. Frosts are rare.

These conditions result in very rapid establishment of groundcover species when soils are exposed and moist. However, this is not relevant to erosion hazard or water pollution as soil erosion mitigation and water pollution control will be effected by retention of pine needle litter and logging slash rather than the recovery of ground-cover vegetation.

Generally weather conditions will allow harvesting operations to continue throughout the year subject to normal wet weather restrictions. Occasionally operations may be stopped altogether by periods of wet. See Code of Logging Practice for Conifer Plantations.

References Rosewall C.J. & Turner J.B. *Rainfall Erosivity in New South Wales.* **Technical Handbook No. 11 (1st Edition), Soil Conservation Service of New South Wales**(1992)

Pilgrim D. H. (ed) *Australian Rainfall and Runoff - A guide to flood estimation,* **The Institute of Engineers of Australia,** (1987)

(c) Geology

The prominant geology comprises Tertiary lava sheets overlaying the Mesozoic sediment of the clarence Moreton Basin.

Bedding planes

There are no obvious bedding and fracture planes in the area. Similarly this geology is now very stable with no porous rocks or other strata overlying impermeable layers. The geology of the area presents no problems in relation to road construction.

Mass Movement

There are no signs of mass movement in the harvest area and no problems are contemplated as no road construction is needed and timber extraction will use walkover techniques.

References *1:250,000 Geological Survey (Map & Commentary) Warwick Sheet.* **NSW Dept Minerals & Energy** 1972

d) Soils

Soil types

The soils of the Planning unit are fine grained volcanics comprising moderate to high fertility chocolate kraznozems over basalt parent material. Depth above basalt rarely exceeds 1.5 m (A horizon 10-35 cm , B horizon >45 cm) and the surface texture is clay loam grading into a heavy clay subsoil.
Ten sampling sites were selected over the whole Plantation , representing typical locations within the nett harvest areas. Soil sampling sites are shown on the Harvesting plan Operational Map. Soil samples verified dispersibilty in the field.

Description and profile

These soils consist of a thick plant layer over a brownish black or darkish red brown, strongly structured clay loam topsoil layer with a self mulching surface. This layer is underlain by a dark reddish brown strongly structured light clay A2/B1. All topsoil layers are characterised by abundant faunal mixing, moderate coherence and slight to moderate acidity. These layers overlie a dark reddish brown, strongly structured, strong, acid, strongly cherent main subsoil layer which usually grades into strongly weathered basalt parent material below 70 cm depth.

All sites within the net harvest are deep enough to allow cross bank or roll-over bank construction associated with roads or snig tracks.

Reference ; Soils Report Toonumbar Planation,Soil Scientist Justin Claridge, Field sampling July 1996.

Erodibility

Soil erodibility factor K is taken from the Toonumbar soil report July 1996.
Values range from 0.03 (topsoil ridgeline) to 0.025 (subsoil upper slope). A figure of **K = 0.03** has been adopted as a worst case scenario.

Texture

The topsoils are clay loams, grading to a light to medium clay in the B horizon subsoil. They are moderately well drained with a high proportion of angular and sub-angular strongly weathered rock fragments throughout the profiles on the steeper terrain.

Dispersibility

Soil Landscape Map	Soils Report Urbenville EIS (1993)
Map Scale	1:125,000
Map source	Veness & Associates 1993 (for reference purposes only)
Soil type	Chocolate kraznozems
Texture class - A horizon	clay loam
B horizon	medium clay
Method of determination	Field Texture
Comment:	Performed by Justin Claridge (Soil Scientist)

EAT class	**A horizon**	8 Not dispersible
(if known)	**B horizon**	2-6 Sometimes dispersive
Method of determination		D2
Comment:		Conducted by qualified soil scientist under laboratory conditions

% dispersion	**A horizon**	
	B horizon	
Method of determination		

Inherent fertility

Whilst these soils are of moderate-high fertility, aspect is the major factor effecting vegetative growth. Ground cover establishment will be rapid on moister slopes, and particularly dependent on the soil moisture regime following harvesting on the drier aspects. Post harvest establishmnet of up to 90% ground-cover is expected within 12 months.

Depth to sub soils and bedrock

Topsoil depth: 10-35 cm Depth to decomposed rock : > 45 cm

Existing erosion

There are no areas of active erosion evident. Most erosion banks appear to have stabilised and should not become active following harvesting.

Qualified soil scientist

Justin Claridge B Sc.Hons (Soils)

(e) Landform (See Description 1.)

Slope

Approximate percentages of plantation area by slope class are:

70 % of the compartment is less than 18°, with only 5 % > 25°< 30.

Average slope has been estimated at 12 degrees in the harvesting plan.

Terrain (See Table 2 under Description 13.)

The general landscape of the areas includes hilly to steep southerly slopes near the eastern extremity of the main range extending eastward from Dome mountain on the Richmond range. Drainage is into Wyndham Creek which feeds the Ricmond River via Eden creek.

Drainage line condition

Drainage lines are well defined and stable.

Aspect

Generally south and south west into Wyndham Creek.

Rockiness

There is no surface rock.

(f) Hydrology

The Planning unit lies in the drainage of Wyndham Creek within the Richmond River catchment and flows to the Richmond River via Eden creek. Drainage lines are well developed and initiate as drainage depressions from the main ridgelines and quickly become clearly defined, stable drainage lines. No swamps or wetlands are found within the net harvest area.
No major water storages are located within 100 metres of these compartments.
There are no prescibed streams in these compartments.

Representative water monitoring sites

Yet to be determined.

Reference Forest Planning Branch *Water quality monitoring program* **SF NSW** 1994

Previous harvesting

Toonumbar Plantation has an history of thinning from the late 60's to the present day. The Planning unit was generally last thinned in 1991-3. To date these compartments has had two thinnings.

Upstream catchment water use

Forestry. The compartment is in the top of the catchment.

Downstream catchment water use

Agricultural (cattle grazing and cropping) and domestic use.

Domestic water use

Whilst many people may pump from the Wyndham Creek for agricultural reasons, human consumption is typically based on rainwater.

(g) Vegetation and ground-cover See Descriptions 3-4.

Understorey comprises generally of lantana and scrubby species (estimated 90% of harvest area) together with an amount of tree litter and logging debris from previous operations.

Live ground-cover recovery within twelve months is anticipated provided normal seasonal rainfall conditions prevail. Because walkover timber extraction techniques will be used, disturbed areas will be minimal and are expected to achieve greater than 70% ground-cover re-establishment within twelve months.

(h) Proposed operation system See Description 5.

Use of existing plantation roads

Log haulage will be predominantly north-east to the Toonumbar Forest Road via the Summerland Way carrying Veneer and sawlogs to Kyogle. All these roads are permanently maintained roads and will require no upgrading or major maintenance.

Toonumbar Forest Road is a crowned gravel road following the ridge top of the Razerback Range. Road drainage is by way of 450mm pipes with sandbagged inlets and stable sandbag outlets.
Dumps K & Q are located adjacent to the Toonumbar forest road.
Trail road accesses dumps M,N & P servicing compartments 306, 307 & 316 .A stable natural earth crossing exists between dump N & M . This road surface is covered with grasses , crofton and various other weeds . Outfall drainage supplemented with rollover banks onto undesturbed vegetation. Maximum grade of Trail road is 5 degrees with maximum batter height 1 metre extending 50 metres. Batters are stable and well vegetated with grasses and weeds.

Dumps H,I & J are serviced by Ridge road which is a stable natural vegetated earth road with outfall drainage supplemented with rollover banks and mitre drains. Road grades in this section are less than 6 degrees. Dump L is located on 305 road approximatley 200 metres from Toonumbar Forest road. A natural earth road with grades no greater than 7 degrees drained by mitre and rollover banks. 305 road is located outside the filter strip . All runoff from Road 305 has sufficent undisturbed ground cover 10 metres prior to the strip to catch any sediment. All drainage outlets are well vegetated and stable. No runoff is discharged driectly into the filter strip. Two piped crossings exist on the lower catchment of this road . No trucks movements will be required along this section and it will be used as access for four wheel drives only . Dump G is situated on the contination of 305 road and logs will be trucked out via Plantation road. Plantation road is located on a native forest ridge line with a natural semi-gravelled surface utilising outfall drainage with mitre drain constructions. Maximum grade along this section does not exceed 8 degrees with maximum batters approximately 50 cms where they occur. Batter lengths are short where the road has cut through crests.

Roads 314 and Track service dumps A,B,C,D,E &F and will be hauled via Plantation raod to Toonumbar Forest road. Five approved crossing exist in this area . The drainage depression

crossing between dumps E & F are natural earth vegetated and stable . Gravelling will be carried out if conditions warrant additional stabilisation of these crossings. The three crossings between dump D and B are piped crossings with stable ehadwalls and outlets. These crossings only carry water at time of heavy rain. No additional work, reshaping , stabilisation or disturbance will be carried out .
All roads are well vegetated and show no signs of active erosion. Road grades do not exceed 10 degrees with the average grade of 5 degrees typical. Maximum batter heights do not exceed 1.5 metres where they occur. All batters are vegetated with grasses and various weeds.

Dump R is serviced by 304 road which passes through neighbouring compartments logged in recent times . 304 road is a natural earth/gravel surface with outfall drainage and pipe constructions. Road grades average 4 degrees with maximum batters of 4 metres, running for maximum lengths of 40 metres which are stabilised and adequately vegetated. Two approved pipe crossings are situated along 304 road with a log bridge crossing where it extends over the main filter strip. Inlets and outlets are stable and well vegetated with grasses & weeds.

Access 1&2 roads are four wheel drive roads and will not carry loaded trucks. Access 1 road has 6 piped crossings. Access 2 road has two natural crossings. These crossings do not carry permanent water , with flows in summer during seasonal rains. All structures are existing ,stable ,vegetated and represent no erosion hazard.
All internal plantation roads are existing permanent , well maintained stable surfaces with no signs of active erosion.
No new roading is proposed in connection with this harvesting operation. Pre-operational grading and patch gravelling will be undertaken where required. Patch gravelling is the spreading of 5-10 m^3 of material over the surface of the road . No disturbance to batters or table drains or sub-soil are required in these operations . No gravel pit or borrow is required within this harvesting unit. Gravel will be transported from outside the area.

Harvesting

The harvesting operation set out in Description 4 results in a cover factor **C = 0.065** in areas where a skidder is to be used.

Location of log dumps/log assembly areas

Logs dumps are located as indicated on the Harvesting Plan Operational Map. Log dumps must be drained using crossfall drainage and runoff from to dumps must not be discharged directly into drainage features or onto extraction tracks or snig tracks.
All dumps are situated to facilitate uphill snigging except at dump R, where downhill snigging is proposed measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the dump immediately before reaching it.
When snigging needs to cross a road to access a log dump all disturbance and damage to the effective drainage mechanisms must be repaired at the completion of snigging from that area.
Loading will be via excavator or forked loader.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description 7 Evaluation of soil and water data

(a) Soil Erosion & Water Pollution Hazard Categories

Soil Erosion & Water Pollution Hazard Categories for the harvest area have been assessed using SOILOSS 5.1. The rating has then been used to assess Soil Erosion & Water Pollution Hazard categories for the net harvest area for both forwarder and skidder operations.

Skidder (Used on areas 15° to 25° - Calculations taken for range 0° to 25°.)

SE&WPHR = R x K x LS x Cx P (5.1) where

R = 3320,

K = 0.03	**From soil survey**
S = slope	**As factored in SOILOSS 5.1**
L = 20 metres	
C = 0.065	**Plantation thinning with skidder**
P = 1.0	**Support Practice Factor**

Table 2 **Soil Erosion and Water Pollution Hazard Categories**

Slope Boundaries (degrees)	Water Pollution Hazard Rating	SE/WPH Category	Indicative % of Net Harvest Area	Erosion Hazard Class
0≤7	< 10	1	20	Low
>7 ≤ 30	11 - 49	2	80	Mod
>30	50+	3	n/a	High
Roads/tracks	High	n/a	n/a	High

Dispersibility

Proportion dispersible soil	A horizon <10% B horizon >10%
Method of determination	D2 Not under laboratory conditions

Comment : The clay B horizon exhibited some dispersion in the E.A.T. Dispersible sub-soil conditions will be adopted for this planning unit.

(b) Other factors

There are no other EHSCS/PCL factors which need to be considered in relation to the planned harvesting of the compartment.

References Standard Erosion Mitigation Guidelines for Logging in New South Wales **Soil Conservation Service, CaLM, NSW** 1993

Rosewall C.J. SOILLOSS A program to assist in the selection of management practices to reduce erosion **Soil Conservation Technical handbook No.11 First Edition** 1990, **2nd Edition** 1993.

(c) Need for additional special conditions

Not applicable

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

FOREST ZONING AND SPECIAL ATTRIBUTES

Description 8 Forest zoning and Special Attributes

(a) Research plots

Research plots exist in compartments 308 & 316 , however they are no longer required and will be treated as the rest of the planning unit. Forteen Inventory Plots (14-25 , 42,43) are located within these compartments (see attached map). Plots are to be treated the same as the rest of the compartment and thinned to a residual basal area of 20 m^2.

(b) Special attributes of the area.

The area is classified "Native Species Plantation - General ".

A one hectare area adjacent to compartment 308 is classified PMP 1.4.7 " Flora Protection " . An endangered plant species *Corchorus cunninghamii* is found in this area.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Condition 3 AUTHORISATION

Condition 3.1 Area Identification

URBENVILLE DISTRICT
Toonumbar State Forest No. 343
1945-52 Age Class
Hoop pine
Compartment 305-309,314-316
Grevillia Management Area
Compartment details are included in attached Schedule (Appendix 1)

Condition 3.2 Authorisation

(a)

This Harvesting Plan is prepared by State Forests of New South Wales (State Forests) under the authority of the Forestry Act 1916. This Harvesting Plan is a condition of all Timber, Forest Products, Contractors and Operators Licences issued in connection with the timber harvesting operations described in the Plan.

(b)

All operations conducted under the authority of the Timber Licence and other licences and agreements issued for the area covered by this Harvesting Plan must comply with:

Licence conditions issued by State Forests under the Forestry Act 1916;

the " **Code of Logging Practice for Conifer Plantations** (1991);

the **"Standard Erosion Mitigation Guidelines for Logging in New South Wales" (SEMGL 1993)** issued by the Soil Conservation Service.

the conditions of **Pollution Licence No 4017** issued by the Environment Protection Authority under the Pollution Control Act 1970. Those general conditions which affect licensees are set out in Schedule "A" attached to every Timber, Contractors and Operators Licence. Where a Pollution Control Licence condition is more stringent than an equivalent in either of the other above-mentioned documents, the Pollution Control Licence condition must prevail.

conditions attached to any relevant licences issued by the National Parks and Wildlife Service under the Endangered Fauna (Interim Protection) Act 1992 and the National Parks and Wildlife Act 1967 (NPW Act);

conditions resulting from any relevant determination of an Environmental Impact Statement;

the regional silvicultural specifications applicable to this operation,

the schedule of specifications for the harvesting and utilisation of timber applicable to this operation, in this case, ***the NORPLY Wood Supply Agreement*** and subsequent amendmnets.

the Code of Procedure for the measurement of timber and other products applicable to this operation, in this case, ***the NORPLY Wood Supply Agreement*** and subsequent amendmnets.

c)
Variations, additions or amendments to the above documents may be made by the responsible authorities at any time , and must be implemented immediately by the State Forests licensee.

Condition 3.3 Environmental Planning & Assessment Act requirements

In preparing this Harvesting Plan, the requirements of Part V of the EPA Act (as amended) and Section 92 of the NPW Act have been considered and an Environmental Impact Assessment (EIA) has been prepared.

Condition 3.4 Breaches and infringements

Non-compliance with any condition or instruction set out in this Harvesting Plan will be dealt with in accordance with Section 3 of **the "Code of Logging Practice - Conifer Plantations"**. Serious breaches may lead to the issue of a Penalty notice, licensee suspension or prosecution.

Condition 3.5 Variations and amendments to this Harvesting Plan

Conditions and requirements of the Pollution Control License cannot be varied in the field without prior written approval from the EPA , other than those areas detailed in condition 5.1 (c).

Variations and other specified approvals detailed in Condition 5.1 (c) or consistent with condition 24A of the Pollution Control Licence, may be made by the Supervising Forest Officer to this Harvesting Plan , subject to the District Forester's counter approval.
Other approvals may be only be made by the Supervising Forester and also subject to the District Forester's counter approval , and where relevant to the Pollution Control Licence , with prior approval from the EPA.

All approvals must be recorded on a variation advice , attached as Section 6 to all operational copies of this Harvesting Plan.
This Harvesting Plan must not be amended by a licensee or contractor.

Condition 3.6 Harvesting Plan availability

Copies of this Harvesting Plan must be held available by the licensee or contractor at the site of harvesting operations at all times that felling, extraction or environmental work is being undertaken within the area covered by this Harvesting Plan.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

CERTIFICATION

Condition 3.7 Plan Preparation (by Forester, Forest Assistant)

Prepared by ....**K .W .PETTY**.....Signature.....

Title ....**A/Marketing Forester** .....Date.....**16th.December 1996**.....

Condition 3.8 District Approval (by District Forester)

I approve the issue of this Harvesting Plan subject to any amendments, endorsements or approvals that may be made following submission to the Environment Protection Authority.

The date that operations will need to commence is ..**13th JAN 97**.....

Signature.....District Forester. Date.....

This Harvesting Plan is approved without amendment/subject to the amendments detailed in the covering letter/document attached. (To be completed by person who originally prepared the Plan who must attach the relevant amendments to the Plan.)

Signature .....Position .....Date.....

Authority (EPA) .....

Signature .....Position .....Date.....

Authority (Other) .....

I note approval of this Harvesting Plan from the above-mentioned authority, together with the amendments they have required to be included in the Plan.

These amendments have been included in the final Plan. This Harvesting Plan comprises pages 1 - 37 attached and the Operational Map marked and referenced to this Harvesting Plan. This is Harvesting Plan No GMA CUT1/96
Signature .....District Forester Date.....

Condition 3.9 Date for commencement of operations.....JAN 1997.....

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

DISTRIBUTION

Condition 3.10 *(Schedule to be attached to each copy and highlighter marked to recipient)*

One copy of the plan is required in each case unless otherwise noted.

Timber Licensee	Parts 1,3,4
Contractors	Parts 1,3,4
Operator(s) (where required)	Parts 1,3,4
Supervising Forest Officer(s) (SFO(s))	Parts 1 ,3-5 , (2 optional)
Supervising Forester(s)	All Parts
District Forester	All Parts
District Office Register	All parts
Compartment History File	All Parts
Regional Office (optional)	All Parts
Soil Conservationist (Forestry)	All Parts
Forest Planning Branch, Head Office, for distribution to:	
Environment Protection Authority	All Parts (3 copies)

Condition 3.11 INDUSTRY FIELD SUPERVISORS/BUSH SUPERVISORS ACKNOWLEDGEMENT

I acknowledge that I have received a copy of Harvesting Plan No GMA CUT1/96 and that I understand the Conditions of the Plan as explained to me by a State Forests officer.

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Condition 3.12 Industry endorsement

This Plan has been signed and endorsed on behalf of industry prior to commencement of operations.

Signature .....Position.....Date .....

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

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Condition 4 OPERATIONAL CONDITIONS

Condition 4.1 Harvesting Activity Description

Third thinning of thinned 1945-52 Age Class *Auracaria Cunninghamiana* stand to a residual basal area of $20m^2$ /hectare.

Condition 4.2 Tree-marking and Harvest Regulation

Tree-marking colour	2 Pink lines	= Trees marked for retention and not to be damaged.
	Pink Dot	= Trees marked for removal
Area Marking colour	Blue	= Compartment boundary
	Pink 'D'	= Log dump site
	Orange	= Road or track location

Condition 4.3 Order of Working

(a) Wet weather (winter), dry weather (summer) and intermediate harvesting areas

Wet weather, dry weather and intermediate weather areas allocated for harvesting are shown on the Plan Map. These areas must be harvested in accordance with seasonal conditions unless otherwise approved by the SFO.

(b) Wet weather controls -roads

During wet weather, the wet-weather controls set out in Section 8 of the Code of Logging Practice will apply. In particular, where runoff occurs from a road surface, haulage may not occur unless the road is agravel or sealed road.

(c) Wet weather controls - timber extraction and skidder snigging

During wet weather, timber extraction tracks and snig tracks must not be used where:

(i) there is runoff from the track surface or;

(ii) there is a likelihood of significant rutting leading to turbid runoff from the track surface .

Condition 4.4 Application of erosion and water pollution control Conditions

(a) Basic Water Pollution Categories

Table 3 Soil Erosion and Water Pollution Categories

Slope Boundaries (degrees)	Water Pollution Hazard Category	SE/WPH Category	Indicative % of Net Harvest Area
0≤7	LOW	1	20
>7 ≤ 30	MODERATE	2	80
>30	HIGH	3	n/a
Roads/tracks	HIGH	3	n/a

The SFO is responsible for identifying ground slopes exceeding 30 degrees in the field.

(b) Approved timber harvesting and extraction method

Mechanised felling/processing/bunching;

Extraction by wheeled skidder . Extraction outrows must not be parallel to/& immediately adjacent to the filter strips. No box cuts are to be used.
Walkover extraction must be used wherever practicable in preference to snig track construction.
Snig tracks must not be located or constructed where they cannot be drained effectively.
Topsoil diturbance must be minimised during snig tarck construction, where sidecut construction is not required. Blading-off on snig tracks is not permitted.
Snigging along roads must only occur in order to avoid snig track construction and where approved by the SFO. Effective road drainage must be re-instated immediatley at the completion of the snigging operation.
All snigging will be uphill , except to Dump R in compartment 315 .
Dumps will be drained by crossfall drainage.

Haulage involving the use of existing natural surface roads and gravelled roads as shown on the Map. Log stockpiles and loading areas are indicated on the Map.

Harvesting operations may be conducted throughout the year subject to the application of normal wet weather closure procedures and restriction to wet weather areas as set out in Condition 4.4.

c) Slope limits for the area

Maximum slope for harvesting	30 degrees
Maximum slope for snig track construction	30 degrees
Maximum side slope for snig track construction	30 degrees
Maximum road grade permitted	10 degrees
Maximum side slope for road construction without engineering design	30 degrees

(d) Drainage feature protection

Water courses and drainage lines must be protected by filter strips, in accordance with Table 4.

Table 4 Filter strip widths

		DRAINAGE FEATURE		STRIP WIDTH EITHER SIDE
SE/WPHC	**WPHC Slope**	**Catchment**	**Slope**	**Filter**
	(degrees)	(hectare size)	(degrees)	(metres)
1	0 ≤ 7	< 40	-	5
2	> 7 to ≤ 30	< 40	-	10
3	N/A	< 40	< 18	15
3	N/A	< 40	**greater > 18**	20
1-2	0 - 30	**greater >40**	< 18	20
1-2	0 -30	**greater > 40**	**greater > 18**	30

Buffer strips must be 5m wide on each drainage depression
NOTE: The widths above equal or exceed the requirements of PCL No 4017

Filter strips are indicated on the Plan Map.

The width of filter strips on watercourses, prescribed streams and drainage lines must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

Filter strips will not be marked in the field as trees will be marked for removal. **It is the contractor's responsibility to observe the correct distance from drainage lines and watercourses for filter.**

It is also the contractors responsibility to identify the 5 metre zone within the filter strip.

(e) Operational Protection

Felling and extraction in filter strips

Trees may be felled within a filter strip where they form part of the plantation and where it is necessary to avoid later windthrow, or where it is necessary for the construction of road, extraction track or snig track crossing structures.

Where necessary to avoid later windthrow, the following must apply :

a) trees may be felled into watercourses. In such cases, crowns, logs and substantial debris (*greater than 100mm in diameter & 3 meters in length*) resulting from logging must be removed with the minimal disturbance to the bed and banks, unless removal would result in more damage to the bed and banks than non-removal. Instances where crowns, logs, or substantial debris are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for doing so.

b) trees may be felled into drainage lines, wetlands or swamps, in which case crowns and logs of felled trees must be removed with minimal disturbance to the bed and banks, unless removal would result in more damage than non-removal. Instances where crowns and logs are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for doing so.

c) machinery may enter a filter strip on a watercourse, drainage line, swamp or wetland to fell or extract felled trees, providing it does not enter the five metre zone and soil disturbance is minimised.

Soil disturbance must be minimised by the following techniques:

(i) maximum use of skidders and minimal use of tracked machine;

(ii) minimal use of blades;

(iii) use of slash to protect the soil during extraction;

(iv) minimise skewing on tracks;

(v) deliberate spreading of slash over disturbed areas at the completion of extraction in each section.

Machinery other than felling machinery must not enter the five metre zone, except for the construction and use of approved road, extraction track or snig track crossings.

Two approved snig track crossings are situated in cpt 315 to facilitate extraction to dump R. Pipes &/or hollow logs will be used during logging with the structured removed following harvesting.
Measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the crossing immediately (10 metres of undisturbed sediment filter is required) before reaching it.

Felling and extraction in drainage depression buffer strips
Buffer strips must be provided along all drainage depression within the planning units. Buffer strips must be 5 metres wide each side of the drainage depression.
Machinery must not operate in buffer strips when the soil is saturated.

Machinery operating within buffer strips must :

a) minimise soil exposure ; and
b) not cause channelised flow.

This must be achieved by :

a) the use of walkover techniques wherever possible; and
b) preventing sewing of machinery tracks; and
c) operating with the blade up at all times; and
d) not snigging along drainage depressions.

No earthworks can be undertaken within buffer strips except for the construction of road, extraction track or snig track crossings.

The width of buffer strips on drainage depressions must be measured from the apparent centre of the drainage depression.

It is the contractor's responsibility to identify plantation drainage depressions encountered in the field.

Snig track drainage

Sections of extraction tracks and snig tracks must be progressively drained at the completion of logging operations around each section of track, using one of the following techniques, or a combination thereof :

a) existing ground cover must be retained as far as practicable. Where this prevents concentrated water flow in excess of the distances specified in Table 5, constructed drainage is not required; or

b) slash and logging debris must be retained as far as practicable. Where retained slash will prevent concentrated water flow in excess of the distances specified in Table 5 and no post logging burning is planned, constructed drainage is not required; or

c) outfall drainage must be used as far as practicable. Where outfall drainage will prevent concentrated flow in excess of the distances in Table 5, constructed drainage is not required.

Where drainage by the above techniques cannot be achieved, then drainage must be constructed that does not exceed the distances in Table 5.

Table 5 : Maximum Spacing of Extraction/Snig Track Drainage Structures (metres)

Track grade (degrees)	Water Category	Pollution	Hazard
	1	2	3
5	200	150	100
10	150	100	60
15	80	60	40
20	60	40	25
25	40	30	20
30	30	25	15
35	25	20	10

Snig track and extraction track drainage structures must be designed to:

a) have sufficient capacity to convey the peak flow from a 1:2 year storm event; and

b) divert water onto stable surfaces; and

c) minimise the unchecked flow of water directly into watercourses and drainage lines or onto roads and log dumps; and

d) divert water at a velocity which minimises damage to the structure.

Outfall drainage, crossbanks, mitre drains outlets are placed on the contour and directed onto undisturbed vegetated ground or logging slash. Sediment sheeting will also be used to achieve the required outcomes stated above. To minimise unchecked flow into watercourses and drainage lines or onto roads and log dumps drainage structures will be placed above the feature and diverted onto undisturbed ground.

Where crossbanks are used they must be constructed to a minimum unconsolidated effective height of 35cm, or a consoildated effective bank height of 25cm, unless otherwise calculated in accordance with the above.
Crossbanks must not be constructed of bark.
Drainage must be effected as soon as practicable at the completion of operations on each extraction track or snig track, and in any event within 2 days, unless soil conditions preclude construction of effective drains or would lead to increased soil erosion. Instances where the drainage is not effected within two days of the completion of logging operations must be documented on the SFO's copy of the harvesting plan, including the reasons why.

The number of snig tracks or extraction tracks open at any one time must be kept to a minimum.

Drainage must be effected if the use of an extraction track or snig track is to be temporarily discontinued in accordance with Table 6:

Table 6: Drainage of Extraction Tracks and Snig Tracks at Temporary Cessation of Operations

Water Pollution Hazard Category	Monthly Rainfall Erosivity Rating	# of Days
1	N/A	10
2	<900	8
	>900	5
3	<900	5
	>900	3

Snigging and timber extraction must occur in an uphill manner unless downhill snigging maintains or decreases the potential for water pollution, or unless phsyical constraints preclude uphill extraction.
Where downhill snigging is proposed, one of the following techniques or a combination thereof must be used:

a) downhill snig tracks must enter the log dump from the side or below;

b) a drainage structure must be in place immediately before a snig track enters the log dump, at the end of each day's operation.

Where harvesting operations are planned in dispersible soils :

a) no more than 30% of the dispersible soil horizon, measured over any 20m length of track, amy be exposed on extraction tracks or snig tracks. This must be achieved by either or both :

i) maintaining topsoil cover where the topsoil is non-dispersible ; or

ii) using logging slash and walkover extraction techniques.

Crossbank construction, if required, must avoid exposing the dispersible soil horizon wherever practicable.

Snig Track crossings of drainage features

Five snig track crossings exist in compartment 314/315 to access dump R . All crossings are existing structures that have been used in the previous two thinnings. All crossing are natural features except the crossing directly adjacent to dump R . A hollow log will be used at this crossing to allow snigging to dump R . The filter strip contains water only at the time of rainfall and is not permanent throughout the year . Logging of this compartment will be avoided in the times of high rainfall. All crossings are stable due to their rocky bottom and vegetated rocky approaches . All crossings will be crossed at right angles and snigging will avoid directly approaching the feature. Side logs will be used to contain any spoil and prevent it from entering the filter strip . Mat sheeting will also be available to assist prevention of spoil. No additional reshaping of the bed or banks is anticipated . To protect and stabilise the sub-soil slash and logging debris will be used to prevent the logs from scouring the ground . This has proven effective in the past to raise the logs off the ground.
Temporary cross bank drain will be constructed within 20 metres of the crossing at the completion of extraction each day until final completion when permannet drains are constructed.
The approaches and banks will be sown will a seed mix at the rate of 20kg/ha on completion of logging. Stabilisation assessment will be carried out by the SFO on completion of logging and by follow up compliance audits by the Marketing Forester.
No other crossings are anticipated for construction.

Existing Roads

No construction of new roads is permitted under this Harvesting Plan.

Roads must be drained during and upon completion of logging operations.
Road drainage structures must be located, constructed and maintained in such a way that they will:

a) have sufficient capacity to convey the peak flow from a 1:5 year storm; and

b) minimise the unchecked flow of water from onto extraction tracks, snig tracks or log dumps by constructing rollover features before reaching these features onto stable vegetated ground; and

c) not discharge water from table drains directly into watercourses, drainage lines, wetlands or swamps, by draining the road at the first opportunity from the drainage feature and at least within the spacings of Table 5 for WPHC 3.

d) divert water onto stable surfaces capable of handling concentrated water flow and which provide for efficient sediment trapping by using one of the following techniques, or a combination thereof:
(I) diverting flow onto undisturbed vegetation;
(ii) diverting flow onto slash and logging debris;
(iii) installing natural or artifical sediment barriers below drainage structures.

Where water diverted by a drainage structure discharges onto a batter of greater than one metre in height, a drop down structure and dissipater must be used.

Road drainage must be designed and maintained to prevent erosion of the road surface using one of the following techniques, or a combination thereof:

a) outfall drainage;

b) relief pipes or mitre drains spaced at intervals according to figure 1, with a minmum spacing of 20 metres.

c) cross banks constructed to a minimum unconsolidated effcetive height of 35cm, or a consolidated bank height of 25cm, unless otherwise calculated in accordance with the above conditions at maximum spacings in accordance with Table 5 for WPHC 3;

and any other techniques that are required.

Windrows must be removed from the shoulders of all roads unless specifically constructed to prevent erosion of fill batters or where infall drainage is used. Where it is not possible to remove windrows they must be cut through at regular intervals, equivalent to a maximum of two-thirds the distances required for drainage structures.

Blading-off of roads may be permitted only where damage is minimal and subsequent drainage and repair is possible.

Each blading-off operation must be approved by the SFO. Where blading-off occurs, the material removed must be placed on a recoverable position and replaced once the logging operation is completed.
Log haulage is not necessary and not permitted between dumps L & G along 305 road.

Location of log dumps/log assembly areas

Logs dumps are located as indicated on the Harvesting Plan Operational Map.
Log dumps must be located out of filter and buffer strips. Debris from log dumps must not be placed in, or within 10 metres of, filter strips.
Any runoff drainage from log dumps during and upon completion of logging operations must be dispersed onto stable surfaces, and not discharged directly into watercourses or drainage lines or onto extraction tracks or snig tracks. this will be achieved by levelling the dump to enable water to disperse over a large area through slash and other logging debris.

Dumps must not be stripped of topsoil prior to harvesting.

Upon completion of operations the log dump surface must be left in a stable condition by using one of the following techniques or a combination thereof:

a) retaining a 70% cover of logging slash;

b) seeding the log dump with a cover crop, 20kg/ha.

Logging operations by wheeled loaders and trackscavators must cease where there is runoff from the log dump surface.

Condition 4.5 Research and Inventory Plots

Forteen Inventory Plots 14-25, 42,43 exist in the planning unit. **Tree measurements must be recorded by the SFO before and after thinning on the sheets provided.**

Condition 4.6 Modified harvest conditions for special emphasis areas

(a) Native forest retention area

Not applicable.

(b) Boundary fences

Care must be taken not to fall trees over the boundary fences which are indicated on the Plan Map. Fences must be repaired immediately if damage results. Tree/slash falling adjacent to fence lines should be removed for a distance of 1.5 metres on either side.

(c) PMP 1.4.7 Flora Protection

A threaten species ***Corchorus cunninghamii*** is located adjacent to compartment 308. An area of one hectare is shown on the attached maps. Logging in this area is unlikely to significantly impact on this species. Ground disturbance will be kept to a minimum and all trees must be directed out of this zone. **The SFO is responsible for identifying and marking this zone in the field.**

(d) PMP 1.4.4 Research

Research plots are located in compartments 308 & 316 . These plots are no longer required for research purposes and should be treated the same as the remainder of the planning unit.

Condition 4.7 Specification of type of products to be removed.

Product 1 **Veneer**
- Minimum length 2.7 metres
- Minimum diameter 20 cm small end under bark
- Minimal sweep and bend

Product 2 **Sawlog**
- Minimum log length 2.4 metres
- Minimum diameter 14cm small end under bark
- Minimum diameter 20cm large end under bark
- Logs not meeting veneer specifications are available as sawlogs.

Condition 4.8 Yield information for planning unit GMA CUT1/96

CPT	Area (ha)	Age class	Op BA (m^2)	Veneer (m^3)	Sawlog (m^3)
305	11.6	1945	44.8	**1682**	**297**
306	12.8	1946	42.5	**2011**	**223**
307	6.6	1946	45.4	**1141**	**127**
308/1	8.7	1947	46.9	**1357**	**151**
309/1	5.9	1947	45.1	**871**	**97**
314	13.2	1950	41.5	**2674**	**297**
315	5.8	1950	42.4	**510**	**170**
316	8.5	1952	43.1	**1248**	**139**

Product 1 Veneer 11494 cubic metres

Product 2 Sawlog 1501 cubic metres

Condition 5 INSTRUCTIONS TO SUPERVISING FOREST OFFICERS (SFOs)

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Condition 5.1 SFO' authority to supervise harvesting operations

(a) General

The Supervising Forest Officer responsible for the direct field supervision of this harvesting operation, including tree-marking, log measuring and/or log check measurement, safety, implementation of wet weather controls, and monitoring and reporting generally will be:

The Plantation Marketing Foreman, Toonumbar SF.

The intention is that an individual Marketing Foreman will be responsible for the entire operation within the compartments from commencement to completion.

(b) Relieving SFOs

Relieving SFOs, if required, will be:

The Acting Plantation Marketing Foreman, Toonumbar SF,
The Forest Assistant (Marketing) Urbenville District,
The Marketing Forester, Urbenville District.

(c) SFOs authority

The SFO has authority to approve:

(a) the blading off of natural surface roads provided that damage will be minimal and the removed material is recoveralbe for respreading;

(b) downhill snigging routes where provided for in the Harvesting Plan;

(c) use of natural surface roads for snig track crossings or as snig tracks or timber extraction tracks to dumps provided restoration of the road for wheeled traffic is undertaken as necessary and use of the road significantly reduces soil distrubance;

(d) the exact field location of topsoil stockpiles for later recovery use;

(e) the exact location of log dumps commensurate with the operational Map;

(f) the location and type of temporary drainage line crossings for snig/extraction tracks.

All approvals must be noted on a Harvesting Plan Variation Form and copies attached to the relevant master copies of the Harvesting Plan.

Condition 5.2 Tree-marking and other harvesting control requirements.

Tree marking

Tree-marking colour 2 Pink lines = Trees marked for retention and not to be damaged.

	Pink Dot	= Trees marked for removal
Area Marking colour	Blue	= Compartment boundary
	Pink 'D'	= Log dump site
	Orange	= Road or track location

The SFO will supervise and direct the sequence of logging and will mark trees for removal.

Filter strips will not be marked in the field , but it is the responsibility of the contractor to identify the 5 metre zone within the Filter.
Filter strips will only be marked in the field where it is necessary to convey a particular message to an operator which cannot be done verbally or in the tree marking for removal strategy. Where marking is used the SFO is responsible for marking filter strips in the field progressively and prior to the commencement of operations into that section of the harvest area.

Contractors and operators are responsible for identifying drainage depressions encounted in the field and taking appropiate protective action within the buffer strip area whilst operating or tranversing the drainage depression.

Condition 5.3 Monitoring and reporting

Daily and Fortnightly reporting

The standard Regional procedures for daily and fortnightly reporting on the conduct of operations must be followed.

The SFO must report the following matters and record their location if necessary on their copy of the Plan Map , Breach Report Form, and the recording map attached to the Plan for that purpose:

(i) instances where trees and/or crowns are not removed from watercourses and drainage lines

(ii) instances where machinery enter the 5 metre internal filter strip zone other than those specified in the plan.

(iii) instances where slash crossings are left in situ;

(iv) instances where the track drainage is not affected within 2 days of completion of operations.

(v) instances of non removal of spoil from bed and banks at road or snig/extraction track crossings;

(vi) instances were road or snig/extraction track crossing stabilisation has occurred within five days;

(vii) non-compliance with any PCL or Forest Practices code conditions relating to any Licenced State Forest Logging operation.

Condition 5.4 Other instructions

There are no other special instructions concerning harvesting supervision.

Condition 5.5 SUPERVISING FOREST OFFICERS ACKNOWLEDGEMENT

I acknowledge that I have received a copy of Harvesting Plan No GMA CUT1/96 and that I have been briefed on the Conditions of the Plan and the supervision and operational control requirements as explained to me by the District Marketing Forester.

Signature .....Date .....

Position.....
Supervising Forest Officer

Signature .....Date .....

Position.....
Relieving Supervising Forest Officer

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
C 42	Representative water monitoring site	Yes	D6(f)
	Have the Water Pollution Hazard Categories (WPHC)s and the Proportion of Dispersible Soil (PDS) been calculated for the area?	Yes	D7(a) C4.4 (a)
	Method for soil sampling for K factor	Yes	D6(d)
	Field sampling - sites?	Yes	Map
	- lab analysis?	Yes	
	- field analysis?	Yes	
1b	Site specific conditions	No	D7(c)
4.	Are areas >30° outside net harvest area?	Yes	Map C4.4(c)
5.	Are areas in WHPC4 outside net harvest area?	Yes	Map C4.4(c)
6.	Drainage feature & protection	Yes	D6(f) C4.4(d) C4.8(g)
7.	Any major water storage?	No	D6(f) C4.4(d)
8.	DDBS conditions included?	Yes	C4.4(d)
9.1(c)	Filter strip on Map?	Yes	Map
10.	Conditions for marking/ identifying:		
	- filter strips	Yes	C4.2 C4.4(d)
	-buffer strips		C4.4(d)
	in the field		C4.4(d)
13.	Reporting accidental felling into filter strips	Yes	C5.3
14.,20.,22.	See 10		
24.	Specify techniques in DDBS	Yes	C4.4(e)

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
47.	Road design, etc. for 1:10 yr. storm event: What techniques for 12 month stabilisation?	Yes	D6(h) C4.4(f)
48.	Are roads shown on Map?	Yes	Map
49.	If road traverses area over 30° what techniques for 1:10 storm event?	No	D6(h)
	What techniques for 6 month stabilisation of road?	No	D6(h)
50.(a),(b)	What is maximum road grade?	Yes	C4.4(f)
51.	Who will mark roads in field?	Yes	C4.4(f)
52.	What is maximum clearing width for road formation?	Yes	C4.4(f)
53.	Is any roadside clearing proposed? If so what techniques for 70% ground-cover within 12 months?	No	D6(h)
57.	Any borrow or gravel pits? If so what batter and stabilisation techniques are required?	No	D6(c) C4.4(f)
60.	What design criteria for stable road batters within 12 months?	No	C4.4(f)
63.	Do road drainage techniques specify - peak flow 1:5 year storm capacity? - stable surface water diversion? - minimisation of unchecked flow? - use of sediment traps if necessary?	Yes	C4.4(f)
64.	What is spacing and type of road drainage structures?	Yes	C4.4(f)

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
65.	Is an alert condition needed for cutting of roadside waterholding windrows?	No	
66.	Is an alert condition needed to emphasise 2 day removal of debris from drainage structures?	No	
67.	Is an alert condition needed for reporting of blading off approvals?	No	
71.	Are drainage feature crossing structures for roads specified for location, type and capacity?	Yes	C4.4(f)
74.	Is a report condition included to cover spoil non-removal from drainage features?	Yes	C5.3(c)
76.	Is a report condition included to cover reporting that crossing stabilisation is not completed within five days?	Yes	C5.3 (c),.
77.	Are techniques listed to leave crossing sites stable?	Yes	C4.4(c)
78	Are techniques specified for stabilisation of roads that are no longer required?	Yes	D6(h), C4.4(f)
79.	Have any old roads been evaluated?	No	D6(h)
80	Are alert conditions required for dispersible soils?	No	D13(a)
81.	Are protection techniques spelt out for roads traversing dispersible soils?	No	

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
82.	Are alert conditions for wet weather restrictions included for roads?	Yes	C4.3(b)
83.	Is a report condition included to cover crossing stabilisation not being completed within 5 days?	Yes	C5.3
84.	Are techniques listed to leave crossings stable?	Yes	C4.4(e)
85.	Is a report condition needed to cover none removal of temporary crossings?	Yes	C5.3
86.	Are there any crossings of drainage features other than drainage depressions by extraction tracks?	Yes	C4.4(e) C5.1
	Are extraction track crossing locations type and capacity specified?	Yes	C5.1
	Is a reporting condition included for SFO approvals for crossings?	Yes	C5.1(c)
	is a report condition included for non-removal of spoil from drainage features?	Yes	C5.3
89.	What conditions are specified for effective extraction track drainage?	Yes	C4.4(e)
92.	Is an alert condition needed for timber extraction along roads?	No	
93	Are alert conditions for wet weather restrictions included for timber extraction tracks?	Yes	C4.3(c)

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
99	Do specifications for drainage of timber extraction tracks include: - capacity for peak flow in a 1:2 year storm event? - diversion onto stable surfaces? - minimise unchecked flow into drainage features? - divert water at minimum damage to structure?	Yes	C4.4(e)
103.	Is minimum specification for bank height used?	Yes	C4.4(e)
105.	Is a reporting condition needed for non-drainage of timber extraction tracks over two days after use has ceased?	Yes	C5.3
107.	Is an alert condition for temporary cessation of use drainage condition required?	No	
112	Is timber extraction being undertaken on dispersible soils?	No	D6(d) D7(a)
	If so, have alert conditions have been included?	No	
119	Have specifications for log dump location and drainage been included?	Yes	C4.8(h)
120	Is an alert condition for the use of traxcavators and wheeled loaders in relation to wet weather necessary?	No	

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

HARVESTING PLAN PREPARATION CHECKLIST

POLLUTION CONTROL LICENCE CONDITION CHECKLIST
PLAN PREPARATION PCL Sch2 Div 3

Condition No.	Condition Title/Enquiry	Entry	Plan Ref.
	What other conditions listed in Sch 2 Div 3 need to be included as alert conditions in this Plan?	None	
	Are any appendices required?	No	

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

NOTES

Copies of variations and approvals which apply to this Plan should be attached here.

NOTES

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

NOTES

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

CLEARANCE CERTIFICATE

HARVESTING PLAN No. ...GMA CUT1/96.....

TOONUMBAR..STATE FOREST.....URBENVILLE..DISTRICT

To M.....Supervising Forest Officer

I request approval for me to move my logging crew and all associated machinery from the above mentioned area to the next Planning Unit in accordance with Section 3.5 of the Code of Logging Practice.

I certify that:

(a) all permanent roads, trails and mitre drains have been cleared of harvesting debris;
(b) butt damage to retained trees has been kept to acceptable limits;
(c) all trees marked for removal have been felled;
(d) utilisation limits have been satisfactorily met;
(e) stump heights conform to requirements;
(f) all hanging trees have been felled and brought down;
(g) all log dump sites/landings/log stack sites have been satisfactorily restored as required;
(h) harvesting debris is not accumulated around retained trees;
(I) all accumulated litter has been disposed of properly;
(j) all filter, protection and buffer strip requirements have been complied with;
(k) all snig track, extraction track and temporary logging road drainage has been installed satisfactorily and other required rehabilitation work has been completed;
(l) all necessary repairs to damaged roads, signs, fences and other structures have been carried out.

I believe that I have met all my obligations under the conditions of the Timber Licence, the Pollution Control Licence, and/or any licence issued under Section 120 of the National Parks and Wildlife Act, which apply to the Compartment (Section, Coupe) just completed , as stated in this Harvesting Plan.

Signature.....Licence No.....Date .....
Contractor/licensee

As a result of inspections of the logging operations made in accordance with this Harvesting Plan, I am satisfied that, to the best of my knowledge, the licensee/ contractor responsible for this harvesting operation has satisfactorily completed all work and approval is given for her/him to remove her/his machinery and equipment and leave the area/ commence operations in another Planning Unit.

This clearance does not release the licensee/contractor from any obligation to undertake any remedial work if subsequent deficiencies are found during any inspections of the area made within 12 months of the date of this post- harvesting inspection.

Last inspection was made on .....(Date)

Signed .....(Date).....

Toonumbar 305-309, 314-316

RECEIVED
04 FEB 1997

Addendum: Reg#1129 Previous Register #1100, 1123

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

EAT class	**A horizon**	8 Not dispersible
(if known)	**B horizon**	2-6 Sometimes dispersive
Method of determination		D2
Comment:		Conducted by qualified soil scientist under laboratory conditions

% dispersion	**A horizon**	
	B horizon	
Method of determination		

Inherent fertility

Whilst these soils are of moderate-high fertility, aspect is the major factor effecting vegetative growth. Ground cover establishment will be rapid on moister slopes, and particularly dependent on the soil moisture regime following harvesting on the drier aspects. Post harvest establishmnet of up to 90% ground-cover is expected within 12 months.

Depth to sub soils and bedrock

Topsoil depth: 10-35 cm Depth to decomposed rock : > 45 cm

Existing erosion

There are no areas of active erosion evident. Most erosion banks appear to have stabilised and should not become active following harvesting.

Qualified soil scientist

Justin Claridge B Sc.Hons (Soils)

(e) Landform (See Description 1.)

Slope

Approximate percentages of plantation area by slope class are:

70 % of the compartment is less than 18°, with only 5 % > 25°< 30.
Hence 15% of the compartment is between 18 & 25° .
No slopes greater than 30° where identified during the planning process.
Average slope has been estimated at 12 degrees in the harvesting plan.

Terrain (See Table 2 under Description 13.)

The general landscape of the areas includes hilly to steep southerly slopes near the eastern extremity of the main range extending eastward from Dome mountain on the Richmond range. Drainage is into Wyndham Creek which feeds the Ricmond River via Eden creek.

Drainage line condition

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description 7. Evaluation of soil and water data

(a) Soil Erosion & Water Pollution Hazard Categories

Soil Erosion & Water Pollution Hazard Categories for the harvest area have been assessed using SOILOSS 5.1. The rating has then been used to assess Soil Erosion & Water Pollution Hazard categories for the net harvest area for both forwarder and skidder operations.

Skidder (Used on areas 15° to 25° - Calculations taken for range 0° to 25°.)

SE&WPHR = R x K x LS x Cx P (5.1) where

R = 3320,

K = 0.03	**From soil survey**
S = slope	**As factored in SOILOSS 5.1**
L = 20 metres	
C = 0.065	**Plantation thinning with skidder**
P = 1.0	**Support Practice Factor**

Table 2 **Soil Erosion and Water Pollution Hazard Categories**

Slope Boundaries (degrees)	Water Pollution Hazard Rating	SE/WPH Category	Indicative % of Net Harvest Area	Erosion Hazard Class
0≤7	< 10	1	20	Low
>7 ≤ 30	11 - 49	2	80	Mod
>30	50+	n/a	n/a	High
Roads/tracks	High	n/a	n/a	High

Dispersibility

Proportion dispersible soil A horizon <10%
B horizon >10%

Method of determination D2 Not under laboratory conditions

Comment : The clay B horizon exhibited some dispersion in the E.A.T. Dispersible sub-soil conditions will be adopted for this planning unit.

(b) Other factors

There are no other EHSCS/PCL factors which need to be considered in relation to the planned harvesting of the compartment.

References Standard Erosion Mitigation Guidelines for Logging in New South Wales **Soil Conservation Service, CaLM, NSW** 1993

Rosewall C.J. SOILLOSS A program to assist in the selection of management practices to reduce erosion **Soil Conservation Technical handbook No.11 First Edition** 1990, **2nd Edition** 1993.

(c) Need for additional special conditions
Not applicable

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Five snig track crossings exist in compartment 314/315 to access dump R . All crossings are existing structures that have been used in the previous two thinnings. All crossing are natural features except the crossing directly adjacent to dump R . A hollow log will be used at this crossing to allow snigging to dump R . The filter strip contains water only at the time of rainfall and is not permanent throughout the year . Logging of this compartment will be avoided in the times of high rainfall. All crossings are stable due to their rocky bottom and vegetated rocky approaches . All crossings will be crossed at right angles and snigging will avoid directly approaching the feature. Side logs will be used to contain any spoil and prevent it from entering the filter strip . Mat sheeting will also be available to assist prevention of spoil. No additional reshaping of the bed or banks is anticipated . To protect and stabilise the sub-soil slash and logging debris will be used to prevent the logs from scouring the ground . This has proven effective in the past to raise the logs off the ground.
Temporary cross bank drain will be constructed within 20 metres of the crossing at the completion of extraction each day until final completion when permannet drains are constructed.
The approaches and banks will be sown will a seed mix at the rate of 20kg/ha on completion of logging. Stabilisation assessment will be carried out by the SFO on completion of logging and by follow up compliance audits by the Marketing Forester.
No other crossings are anticipated for construction.

Existing Roads

No construction of new roads is permitted under this Harvesting Plan.

Roads must be drained during and upon completion of logging operations.
Road drainage structures must be located, constructed and maintained in such a way that they will:

a) have sufficient capacity to convey the peak flow from a 1:5 year storm; and

b) minimise the unchecked flow of water from onto extraction tracks, snig tracks or log dumps by constructing rollover cross banks or mitre drains immediately above the feature consistent with haulage practicalities (outlets must be onto stable vegetation or harvest debris); and

c) not discharge water from table drains directly into watercourses, drainage lines, wetlands or swamps, by draining the road at the first opportunity from the drainage feature and at least within the spacings of Table 5 for WPHC 3.

d) divert water onto stable surfaces capable of handling concentrated water flow and which provide for efficient sediment trapping by using one of the following techniques, or a combination thereof:
(i) diverting flow onto undisturbed vegetation;
(ii) diverting flow onto slash and logging debris;
(iii) installing natural or artifical sediment barriers below drainage structures.

Where water diverted by a drainage structure discharges onto a batter of greater than one metre in height, a drop down structure and dissipater must be used.

Road drainage must be designed and maintained to prevent erosion of the road surface using one of the following techniques, or a combination thereof:

a) outfall drainage;

b) relief pipes or mitre drains spaced at intervals according to figure 1, with a minmum spacing of 20 metres.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

EAT class	**A horizon**	8 Not dispersible
(if known)	**B horizon**	2-6 Sometimes dispersive
Method of determination		D2
Comment:		Conducted by qualified soil scientist under laboratory conditions

% dispersion	**A horizon**	
	B horizon	
Method of determination		

Inherent fertility

Whilst these soils are of moderate-high fertility, aspect is the major factor effecting vegetative growth. Ground cover establishment will be rapid on moister slopes, and particularly dependent on the soil moisture regime following harvesting on the drier aspects. Post harvest establishmnet of up to 90% ground-cover is expected within 12 months.

Depth to sub soils and bedrock

Topsoil depth: 10-35 cm Depth to decomposed rock : > 45 cm

Existing erosion

There are no areas of active erosion evident. Most erosion banks appear to have stabilised and should not become active following harvesting.

Qualified soil scientist

Justin Claridge B Sc.Hons (Soils)

(e) Landform (See Description 1.)

Slope

Approximate percentages of plantation area by slope class are:

70 % of the compartment is less than 18°, with only 5 % > 25°< 30.

Average slope has been estimated at 12 degrees in the harvesting plan.

Terrain (See Table 2 under Description 13.)

The general landscape of the areas includes hilly to steep southerly slopes near the eastern extremity of the main range extending eastward from Dome mountain on the Richmond range. Drainage is into Wyndham Creek which feeds the Ricmond River via Eden creek.

Drainage line condition

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Drainage lines are well defined and stable.

Aspect

Generally south and south west into Wyndham Creek.

Rockiness

There is no surface rock.

(f) Hydrology

The Planning unit lies in the drainage of Wyndham Creek within the Richmond River catchment and flows to the Richmond River via Eden creek. Drainage lines are well developed and initiate as drainage depressions from the main ridgelines and quickly become clearly defined, stable drainage lines. No swamps or wetlands are found within the net harvest area.
No major water storages are located within 100 metres of these compartments.
There are no prescibed streams in these compartments.

Representative water monitoring sites

Yet to be determined.

Reference Forest Planning Branch *Water quality monitoring program* SF NSW 1994

Previous harvesting

Toonumbar Plantation has an history of thinning from the late 60's to the present day. The Planning unit was generally last thinned in 1991-3. To date these compartments has had two thinnings.

Upstream catchment water use

Forestry. The compartment is in the top of the catchment.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Downstream catchment water use

Agricultural (cattle grazing and cropping) and domestic use.

Domestic water use

Whilst many people may pump from the Wyndham Creek for agricultural reasons, human consumption is typically based on rainwater.

(g) Vegetation and ground-cover See Descriptions 3-4.

Understorey comprises generally of lantana and scrubby species (estimated 90% of harvest area) together with an amount of tree litter and logging debris from previous operations.

Live ground-cover recovery within twelve months is anticipated provided normal seasonal rainfall conditions prevail. Because walkover timber extraction techniques will be used, disturbed areas will be minimal and are expected to achieve greater than 70% ground-cover re-establishment within twelve months.

(h) Proposed operation system See Description 5.

Use of existing plantation roads

Log haulage will be predominantly north-east to the Toonumbar Forest Road via the Summerland Way carrying Veneer and sawlogs to Kyogle. All these roads are permanently maintained roads and will require no upgrading or major maintenance.

Toonumbar Forest Road is a crowned gravel road following the ridge top of the Razerback Range. Road drainage is by way of 450mm pipes with sandbagged inlets and stable sandbag outlets.
Dumps K & Q are located adjacent to the Toonumbar forest road.
Trail road accesses dumps M,N & P servicing compartments 306, 307 & 316 .A stable natural earth crossing exists between dump N & M . This road surface is covered with grasses , crofton and various other weeds . Outfall drainage supplemented with rollover banks onto undesturbed vegetation. Maximum grade of Trail road is 5 degrees with maximum batter height 1 metre extending 50 metres. Batters are stable and well vegetated with grasses and weeds.

Dumps H,I & J are serviced by Ridge road which is a stable natural vegetated earth road with outfall drainage supplemented with rollover banks and mitre drains. Road grades in this section are less than 6 degrees. Dump L is located on 305 road approximatley 200 metres from Toonumbar Forest road. A natural earth road with grades no greater than 7 degrees drained by mitre and rollover banks. 305 road is located outside the filter strip . All runoff from Road 305 has sufficent undisturbed ground cover 10 metres prior to the strip to catch any sediment. All drainage outlets are well vegetated and stable. No runoff is discharged driectly into the filter strip. Two piped crossings exist on the lower catchment of this road . No trucks movements will be required along this section and it will be used as access for four wheel drives only . Dump G is situated on the contination of 305 road and logs will be trucked out via Plantation road. Plantation road is located on a native forest ridge line with a natural semi-gravelled surface utilising outfall drainage with mitre drain constructions. Maximum grade along this section does not exceed 8 degrees with maximum batters approximately 50 cms where they occur. Batter lengths are short where the road has cut through crests.

Roads 314 and Track service dumps A,B,C,D,E &F and will be hauled via Plantation raod to Toonumbar Forest road. Five approved crossing exist in this area . The drainage depression

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

crossing between dumps E & F are natural earth vegetated and stable . Gravelling will be carried out if conditions warrant additional stabilisation of these crossings. The three crossings between dump D and B are piped crossings with stable ehadwalls and outlets. These crossings only carry water at time of heavy rain. No additional work, reshaping , stabilisation or disturbance will be carried out .
All roads are well vegetated and show no signs of active erosion. Road grades do not exceed 10 degrees with the average grade of 5 degrees typical. Maximum batter heights do not exceed 1.5 metres where they occur. All batters are vegetated with grasses and various weeds. •

Dump R is serviced by 304 road which passes through neighbouring compartments logged in recent times . 304 road is a natural earth/gravel surface with outfall drainage and pipe constructions. Road grades average 4 degrees with maximum batters of 4 metres, running for maximum lengths of 40 metres which are stabilised and adequately vegetated. Two approved pipe crossings are situated along 304 road with a log bridge crossing where it extends over the main filter strip. Inlets and outlets are stable and well vegetated with grasses & weeds.

Access 1&2 roads are four wheel drive roads and will not carry loaded trucks. Access 1 road has 6 piped crossings. Access 2 road has two natural crossings. These crossings do not carry permanent water , with flows in summer during seasonal rains. All structures are existing ,stable ,vegetated and represent no erosion hazard.
All internal plantation roads are existing permanent , well maintained stable surfaces with no signs of active erosion.
No new roading is proposed in connection with this harvesting operation. Pre-operational grading and patch gravelling will be undertaken where required. Patch gravelling is the spreading of 5-10 m^3 of material over the surface of the road . No disturbance to batters or table drains or sub-soil are required in these operations . No gravel pit or borrow is required within this harvesting unit. Gravel will be transported from outside the area.

Harvesting

The harvesting operation set out in Description 4 results in a cover factor **C = 0.065** in areas where a skidder is to be used.

Location of log dumps/log assembly areas

Logs dumps are located as indicated on the Harvesting Plan Operational Map. Log dumps must be drained using crossfall drainage and runoff from to dumps must not be discharged directly into drainage features or onto extraction tracks or snig tracks.
All dumps are situated to facilitate uphill snigging except at dump R, where downhill snigging is proposed measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the dump immediately before reaching it.
When snigging needs to cross a road to access a log dump all disturbance and damage to the effective drainage mechanisms must be repaired at the completion of snigging from that area.
Loading will be via excavator or forked loader.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Description 7 Evaluation of soil and water data

(a) Soil Erosion & Water Pollution Hazard Categories

Soil Erosion & Water Pollution Hazard Categories for the harvest area have been assessed using SOILOSS 5.1. The rating has then been used to assess Soil Erosion & Water Pollution Hazard categories for the net harvest area for both forwarder and skidder operations.

Skidder (Used on areas 15° to 25° - Calculations taken for range 0° to 25°.)

SE&WPHR = R x K x LS x Cx P (5.1) where

R = 3320,

K = 0.03	**From soil survey**
S = slope	**As factored in SOILOSS 5.1**
L = 20 metres	
C = 0.065	**Plantation thinning with skidder**
P = 1.0	**Support Practice Factor**

Table 2 Soil Erosion and Water Pollution Hazard Categories

Slope Boundaries (degrees)	Water Pollution Hazard Rating	SE/WPH Category	Indicative % of Net Harvest Area	Erosion Hazard Class
0≤7	< 10	1	20	Low
>7 ≤ 30	11 - 49	2	80	Mod
>30	50+	3	n/a	High
Roads/tracks	High	n/a	n/a	High

Dispersibility

Proportion dispersible soil	A horizon <10%
	B horizon >10%
Method of determination	D2 Not under laboratory conditions

Comment : The clay B horizon exhibited some dispersion in the E.A.T. Dispersible sub-soil conditions will be adopted for this planning unit.

(b) Other factors

There are no other EHSCS/PCL factors which need to be considered in relation to the planned harvesting of the compartment.

References Standard Erosion Mitigation Guidelines for Logging in New South Wales **Soil Conservation Service, CaLM, NSW** 1993

Rosewall C.J. SOILLOSS A program to assist in the selection of management practices to reduce erosion **Soil Conservation Technical handbook No.11 First Edition** 1990, **2nd Edition** 1993.

(c) Need for additional special conditions

Not applicable

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

the Code of Procedure for the measurement of timber and other products applicable to this operation, in this case, ***the NORPLY Wood Supply Agreement*** and subsequent amendmnets.

c)
Variations, additions or amendments to the above documents may be made by the responsible authorities at any time , and must be implemented immediately by the State Forests licensee.

Condition 3.3 Environmental Planning & Assessment Act requirements

In preparing this Harvesting Plan, the requirements of Part V of the EPA Act (as amended) and Section 92 of the NPW Act have been considered and an Environmental Impact Assessment (EIA) has been prepared.

Condition 3.4 Breaches and Infringements

Non-compliance with any condition or instruction set out in this Harvesting Plan will be dealt with in accordance with Section 3 of **the "Code of Logging Practice - Conifer Plantations"**. Serious breaches may lead to the issue of a Penalty notice, licensee suspension or prosecution.

Condition 3.5 Variations and amendments to this Harvesting Plan

Conditions and requirements of the Pollution Control License cannot be varied in the field without prior written approval from the EPA , other than those areas detailed in condition 5.1 (c).

Variations and other specified approvals detailed in Condition 5.1 (c) or consistent with condition 24A of the Pollution Control Licence, may be made by the Supervising Forest Officer to this Harvesting Plan , subject to the District Forester's counter approval.
Other approvals may be only be made by the Supervising Forester and also subject to the District Forester's counter approval , and where relevant to the Pollution Control Licence , with prior approval from the EPA.

All approvals must be recorded on a variation advice , attached as Section 6 to all operational copies of this Harvesting Plan.
This Harvesting Plan must not be amended by a licensee or contractor.

Condition 3.6 Harvesting Plan availability

Copies of this Harvesting Plan must be held available by the licensee or contractor at the site of harvesting operations at all times that felling, extraction or environmental work is being undertaken within the area covered by this Harvesting Plan.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

DISTRIBUTION

Condition 3.10 *(Schedule to be attached to each copy and highlighter marked to recipient)*

One copy of the plan is required in each case unless otherwise noted.

Timber Licensee	Parts 1,3,4
Contractors	Parts 1,3,4
Operator(s) (where required)	Parts 1,3,4
Supervising Forest Officer(s) (SFO(s))	Parts 1 ,3-5 , (2 optional)
Supervising Forester(s)	All Parts
District Forester	All Parts
District Office Register	All parts
Compartment History File	All Parts
Regional Office (optional)	All Parts
Soil Conservationist (Forestry)	All Parts
Forest Planning Branch, Head Office, for distribution to:	
Environment Protection Authority	All Parts (3 copies)

Condition 3.11 INDUSTRY FIELD SUPERVISORS/BUSH SUPERVISORS ACKNOWLEDGEMENT

I acknowledge that I have received a copy of Harvesting Plan No GMA CUT1/96 and that I understand the Conditions of the Plan as explained to me by a State Forests officer.

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Signature .....Licence No. .....Date .....

Position.....

Condition 3.12 Industry endorsement

This Plan has been signed and endorsed on behalf of industry prior to commencement of operations.

Signature .....Position.....Date .....

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

(a) Basic Water Pollution Categories

Table 3 Soil Erosion and Water Pollution Categories

Slope Boundaries (degrees)	Water Pollution Hazard Category	SE/WPH Category	Indicative % of Net Harvest Area
0≤7	LOW	1	20
>7 ≤ 30	MODERATE	2	80
>30	HIGH	3	n/a
Roads/tracks	HIGH	3	n/a

The SFO is responsible for identifying ground slopes exceeding 30 degrees in the field.

(b) Approved timber harvesting and extraction method

Mechanised felling/processing/bunching;

Extraction by wheeled skidder . Extraction outrows must not be parallel to/& immediately adjacent to the filter strips. No box cuts are to be used.
Walkover extraction must be used wherever practicable in preference to snig track construction.
Snig tracks must not be located or constructed where they cannot be drained effectively.
Topsoil diturbance must be minimised during snig tarck construction, where sidecut construction is not required. Blading-off on snig tracks is not permitted.
Snigging along roads must only occur in order to avoid snig track construction and where approved by the SFO. Effective road drainage must be re-instated immediatley at the completion of the snigging operation.
All snigging will be uphill , except to Dump R in compartment 315 .
Dumps will be drained by crossfall drainage.

Haulage involving the use of existing natural surface roads and gravelled roads as shown on the Map. Log stockpiles and loading areas are indicated on the Map.

Harvesting operations may be conducted throughout the year subject to the application of normal wet weather closure procedures and restriction to wet weather areas as set out in Condition 4.4.

c) Slope limits for the area

Maximum slope for harvesting	30 degrees
Maximum slope for snig track construction	30 degrees
Maximum side slope for snig track construction	30 degrees
Maximum road grade permitted	10 degrees
Maximum side slope for road construction without engineering design	30 degrees

(d) Drainage feature protection

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Water courses and drainage lines must be protected by filter strips, in accordance with Table 4.

Table 4 Filter strip widths

		DRAINAGE FEATURE		STRIP WIDTH EITHER SIDE
SE/WPHC	**WPHC Slope**	**Catchment**	**Slope**	**Filter**
	(degrees)	(hectare size)	(degrees)	(metres)
1	0 ≤ 7	< 40	-	5
2	> 7 to ≤ 30	< 40	-	10
3	N/A	< 40	< 18	15
3	N/A	< 40	greater > 18	20
1-2	0 - 30	greater >40	< 18	20
1-2	0 -30	greater > 40	greater > 18	30

Buffer strips must be 5m wide on each drainage depression
NOTE: The widths above equal or exceed the requirements of PCL No 4017

Filter strips are indicated on the Plan Map.

The width of filter strips on watercourses, prescribed streams and drainage lines must be measured from the top of the bank of the incised channel or, where there is no defined bank, from the edge of the channel.

Filter strips will not be marked in the field as trees will be marked for removal. **It is the contractor's responsibility to observe the correct distance from drainage lines and watercourses for filter.**

It is also the contractors responsibility to identify the 5 metre zone within the filter strip.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

(e) Operational Protection

Felling and extraction in filter strips

Trees may be felled within a filter strip where they form part of the plantation and where it is necessary to avoid later windthrow, or where it is necessary for the construction of road, extraction track or snig track crossing structures.

Where necessary to avoid later windthrow, the following must apply :

a) trees may be felled into watercourses. In such cases, crowns, logs and substantial debris (*greater than 100mm in diameter & 3 meters in length*) resulting from logging must be removed with the minimal disturbance to the bed and banks, unless removal would result in more damage to the bed and banks than non-removal. Instances where crowns, logs, or substantial debris are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for doing so.

b) trees may be felled into drainage lines, wetlands or swamps, in which case crowns and logs of felled trees must be removed with minimal disturbance to the bed and banks, unless removal would result in more damage than non-removal. Instances where crowns and logs are not removed must be documented on the SFO's copy of the harvesting plan, including the reason for doing so.

c) machinery may enter a filter strip on a watercourse, drainage line, swamp or wetland to fell or extract felled trees, providing it does not enter the five metre zone and soil disturbance is minimised.

Soil disturbance must be minimised by the following techniques:

(i) maximum use of skidders and minimal use of tracked machine;

(ii) minimal use of blades;

(iii) use of slash to protect the soil during extraction;

(iv) minimise skewing on tracks;

(v) deliberate spreading of slash over disturbed areas at the completion of extraction in each section.

Machinery other than felling machinery must not enter the five metre zone, except for the construction and use of approved road, extraction track or snig track crossings.

Two approved snig track crossings are situated in cpt 315 to facilitate extraction to dump R. Pipes &/or hollow logs will be used during logging with the structured removed following harvesting.
Measures to prevent concentration of water flow must be taken by way of crossfall drainage and approaching tracks to direct water flow away from the crossing immediately (10 metres of undisturbed sediment filter is required) before reaching it.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Felling and extraction in drainage depression buffer strips
Buffer strips must be provided along all drainage depression within the planning units. Buffer strips must be 5 metres wide each side of the drainage depression.
Machinery must not operate in buffer strips when the soil is saturated.

Machinery operating within buffer strips must :

a) minimise soil exposure ; and
b) not cause channelised flow.

This must be achieved by :

a) the use of walkover techniques wherever possible; and
b) preventing sewing of machinery tracks; and
c) operating with the blade up at all times; and
d) not snigging along drainage depressions.

No earthworks can be undertaken within buffer strips except for the construction of road, extraction track or snig track crossings.

The width of buffer strips on drainage depressions must be measured from the apparent centre of the drainage depression.

It is the contractor's responsibility to identify plantation drainage depressions encountered in the field.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Snig track drainage

Sections of extraction tracks and snig tracks must be progressively drained at the completion of logging operations around each section of track, using one of the following techniques, or a combination thereof :

a) existing ground cover must be retained as far as practicable. Where this prevents concentrated water flow in excess of the distances specified in Table 5, constructed drainage is not required; or

b) slash and logging debris must be retained as far as practicable. Where retained slash will prevent concentrated water flow in excess of the distances specified in Table 5 and no post logging burning is planned, constructed drainage is not required; or

c) outfall drainage must be used as far as practicable. Where outfall drainage will prevent concentrated flow in excess of the distances in Table 5, constructed drainage is not required.

Where drainage by the above techniques cannot be achieved, then drainage must be constructed that does not exceed the distances in Table 5.

Table 5 : Maximum Spacing of Extraction/Snig Track Drainage Structures (metres)

Track grade (degrees)	Water Category	Pollution	Hazard
	1	2	3
5	200	150	100
10	150	100	60
15	80	60	40
20	60	40	25
25	40	30	20
30	30	25	15
35	25	20	10

Snig track and extraction track drainage structures must be designed to:

a) have sufficient capacity to convey the peak flow from a 1:2 year storm event; and

b) divert water onto stable surfaces; and

c) minimise the unchecked flow of water directly into watercourses and drainage lines or onto roads and log dumps; and

d) divert water at a velocity which minimises damage to the structure.

Outfall drainage, crossbanks, mitre drains outlets are placed on the contour and directed onto undisturbed vegetated ground or logging slash. Sediment sheeting will also be used to achieve the required outcomes stated above. To minimise unchecked flow into watercourses and drainage lines or onto roads and log dumps drainage structures will be placed above the feature and diverted onto undisturbed ground.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Where crossbanks are used they must be constructed to a minimum unconsolidated effective height of 35cm, or a consoildated effective bank height of 25cm, unless otherwise calculated in accordance with the above.
Crossbanks must not be constructed of bark.
Drainage must be effected as soon as practicable at the completion of operations on each extraction track or snig track, and in any event within 2 days, unless soil conditions preclude construction of effective drains or would lead to increased soil erosion. Instances where the drainage is not effected within two days of the completion of logging operations must be documented on the SFO's copy of the harvesting plan, including the reasons why.

The number of snig tracks or extraction tracks open at any one time must be kept to a minimum.

Drainage must be effected if the use of an extraction track or snig track is to be temporarily discontinued in accordance with Table 6:

Table 6: Drainage of Extraction Tracks and Snig Tracks at Temporary Cessation of Operations

Water Pollution Hazard Category	Monthly Rainfall Erosivity Rating	# of Days
1	N/A	10
2	<900	8
	>900	5
3	<900	5
	>900	3

Snigging and timber extraction must occur in an uphill manner unless downhill snigging maintains or decreases the potential for water pollution, or unless phsyical constraints preclude uphill extraction.
Where downhill snigging is proposed, one of the following techniques or a combination thereof must be used:

a) downhill snig tracks must enter the log dump from the side or below;

b) a drainage structure must be in place immediately before a snig track enters the log dump, at the end of each day's operation.

Where harvesting operations are planned in dispersible soils :

a) no more than 30% of the dispersible soil horizon, measured over any 20m length of track, amy be exposed on extraction tracks or snig tracks. This must be achieved by either or both :
   i) maintaining topsoil cover where the topsoil is non-dispersible ; or
   ii) using logging slash and walkover extraction techniques.

Crossbank construction, if required, must avoid exposing the dispersible soil horizon wherever practicable.

Snig Track crossings of drainage features

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Five snig track crossings exist in compartment 314/315 to access dump R . All crossings are existing structures that have been used in the previous two thinnings. All crossing are natural features except the crossing directly adjacent to dump R . A hollow log will be used at this crossing to allow snigging to dump R . The filter strip contains water only at the time of rainfall and is not permanent throughout the year . Logging of this compartment will be avoided in the times of high rainfall. All crossings are stable due to their rocky bottom and vegetated rocky approaches . All crossings will be crossed at right angles and snigging will avoid directly approaching the feature. Side logs will be used to contain any spoil and prevent it from entering the filter strip . Mat sheeting will also be available to assist prevention of spoil. No additional reshaping of the bed or banks is anticipated . To protect and stabilise the sub-soil slash and logging debris will be used to prevent the logs from scouring the ground . This has proven effective in the past to raise the logs off the ground.
Temporary cross bank drain will be constructed within 20 metres of the crossing at the completion of extraction each day until final completion when permannet drains are constructed.
The approaches and banks will be sown will a seed mix at the rate of 20kg/ha on completion of logging. Stabilisation assessment will be carried out by the SFO on completion of logging and by follow up compliance audits by the Marketing Forester.
No other crossings are anticipated for construction.

Existing Roads

No construction of new roads is permitted under this Harvesting Plan.

Roads must be drained during and upon completion of logging operations.
Road drainage structures must be located, constructed and maintained in such a way that they will:

a) have sufficient capacity to convey the peak flow from a 1:5 year storm; and

b) minimise the unchecked flow of water from onto extraction tracks, snig tracks or log dumps by constructing rollover features before reaching these features onto stable vegetated ground; and

c) not discharge water from table drains directly into watercourses, drainage lines, wetlands or swamps, by draining the road at the first opportunity from the drainage feature and at least within the spacings of Table 5 for WPHC 3.

d) divert water onto stable surfaces capable of handling concentrated water flow which provide for efficient sediment trapping by using one of the following techniques, or a combination thereof:
(i).diverting flow onto undisturbed vegetation;
(ii) diverting flow onto slash and logging debris;
(iii) installing natural or artifical sediment barriers below drainage structures.

and

Where water diverted by a drainage structure discharges onto a batter of greater than one metre in height, a drop down structure and dissipater must be used.

Road drainage must be designed and maintained to prevent erosion of the road surface using one of the following techniques, or a combination thereof:

a) outfall drainage;

b) relief pipes or mitre drains spaced at intervals according to figure 1, with a minmum spacing of 20 metres.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

c) cross banks constructed to a minimum unconsolidated effcetive height of 35cm, or a consolidated bank height of 25cm, unless otherwise calculated in accordance with the above conditions at maximum spacings in accordance with Table 5 for WPHC 3;
and any other techniques that are required.

Windrows must be removed from the shoulders of all roads unless specifically constructed to prevent erosion of fill batters or where infall drainage is used. Where it is not possible to remove windrows they must be cut through at regular intervals, equivalent to a maximum of two-thirds the distances required for drainage structures.

Blading-off of roads may be permitted only where damage is minimal and subsequent drainage and repair is possible.

Each blading-off operation must be approved by the SFO. Where blading-off occurs, the material removed must be placed on a recoverable position and replaced once the logging operation is completed.
Log haulage is not necessary and not permitted between dumps L & G along 305 road.

Location of log dumps/log assembly areas

Logs dumps are located as indicated on the Harvesting Plan Operational Map.
Log dumps must be located out of filter and buffer strips. Debris from log dumps must not be placed in, or within 10 metres of, filter strips.
Any runoff drainage from log dumps during and upon completion of logging operations must be dispersed onto stable surfaces, and not discharged directly into watercourses or drainage lines or onto extraction tracks or snig tracks. this will be achieved by levelling the dump to enable water to disperse over a large area through slash and other logging debris.

Dumps must not be stripped of topsoil prior to harvesting.

Upon completion of operations the log dump surface must be left in a stable condition by using one of the following techniques or a combination thereof:

a) retaining a 70% cover of logging slash;

b) seeding the log dump with a cover crop, 20kg/ha.

Logging operations by wheeled loaders and trackscavators must cease where there is runoff from the log dump surface.

Condition 4.5 Research and Inventory Plots

Forteen Inventory Plots 14-25, 42,43 exist in the planning unit. **Tree measurements must be recorded by the SFO before and after thinning on the sheets provided.**

Condition 4.6 Modified harvest conditions for special emphasis areas

(a) Native forest retention area

Not applicable.

(b) Boundary fences

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

Condition 5.1 SFO' authority to supervise harvesting operations:

(a) General

The Supervising Forest Officer responsible for the direct field supervision of this harvesting operation, including tree-marking, log measuring and/or log check measurement, safety, implementation of wet weather controls, and monitoring and reporting generally will be:

The Plantation Marketing Foreman, Toonumbar SF.

The intention is that an individual Marketing Foreman will be responsible for the entire operation within the compartments from commencement to completion.

(b) Relieving SFOs

Relieving SFOs, if required, will be:

The Acting Plantation Marketing Foreman, Toonumbar SF,
The Forest Assistant (Marketing) Urbenville District,
The Marketing Forester, Urbenville District.

(c) SFOs authority

The SFO has authority to approve:

(a) the blading off of natural surface roads provided that damage will be minimal and the removed material is recoveralbe for respreading;

(b) downhill snigging routes where provided for in the Harvesting Plan;

(c) use of natural surface roads for snig track crossings or as snig tracks or timber extraction tracks to dumps provided restoration of the road for wheeled traffic is undertaken as necessary and use of the road significantly reduces soil distrubance;

(d) the exact field location of topsoil stockpiles for later recovery use;

(e) the exact location of log dumps commensurate with the operational Map;

(f) the location and type of temporary drainage line crossings for snig/extraction tracks.

All approvals must be noted on a Harvesting Plan Variation Form and copies attached to the relevant master copies of the Harvesting Plan.

Condition 5.2 Tree-marking and other harvesting control requirements:

Tree marking

Tree-marking colour 2 Pink lines = Trees marked for retention and not to be damaged.

HARVESTING PLAN
(GREVILLIA MANAGEMENT AREA -Northern Region)

	Pink Dot	= Trees marked for removal
Area Marking colour	Blue	= Compartment boundary
	Pink 'D'	= Log dump site
	Orange	= Road or track location

The SFO will supervise and direct the sequence of logging and will mark trees for removal.

Filter strips will not be marked in the field , but it is the responsibility of the contractor to identify the 5 metre zone within the Filter.
Filter strips will only be marked in the field where it is necessary to convey a particular message to an operator which cannot be done verbally or in the tree marking for removal strategy. Where marking is used the SFO is responsible for marking filter strips in the field progressively and prior to the commencement of operations into that section of the harvest area.

Contractors and operators are responsible for identifying drainage depressions encounted in the field and taking appropiate protective action within the buffer strip area whilst operating or tranversing the drainage depression.

Condition 5.3 Monitoring and reporting

Daily and Fortnightly reporting

The standard Regional procedures for daily and fortnightly reporting on the conduct of operations must be followed.

The SFO must report the following matters and record their location if necessary on their copy of the Plan Map , Breach Report Form, and the recording map attached to the Plan for that purpose:

(i) instances where trees and/or crowns are not removed from watercourses and drainage lines

(ii) instances where machinery enter the 5 metre internal filter strip zone other than those specified in the plan.

(iii) instances where slash crossings are left in situ;

(iv) instances where the track drainage is not affected within 2 days of completion of operations.

(v) instances of non removal of spoil from bed and banks at road or snig/extraction track crossings;

(vi) instances were road or snig/extraction track crossing stabilisation has occurred within five days;

(vii) non-compliance with any PCL or Forest Practices code conditions relating to any Licenced State Forest Logging operation.

Condition 5.4 Other instructions

EPA

Environment Protection Authority
New South Wales

Civic Tower
Cnr of Jacobs Street
and Rickard Road
Locked Bag 1502
Bankstown
NSW 2200

Telephone .02. 9795 5000
Facsimile .02. 9795 5002

CERTIFIED MAIL

R345149742

FORESTRY COMMISSION OF NSW
LOCKED BAG 23 P.O.
PENNANT HILLS NSW 2120

Our Reference: 600000/D79/Not. Nos. 003876

Your Reference:
7 February, 1997

NOTICE UNDER SECTION 17D(3)
OF THE POLLUTION CONTROL ACT 1970

WHEREAS -

(a) FORESTRY COMMISSION OF NSW is the holder of licence number 004017 in respect of premises situated at LAND IN THE NORTHERN REGION, - which expires on 7 August, 1997.

TAKE NOTICE THAT -

In accordance with the powers vested in the Environment Protection Authority (EPA) under Section 17D(3) of the Pollution Control Act 1970, the EPA with respect to licence number 004017 from the date of this Notice hereby:-

1. Varies this licence by inserting the following compartment descriptions, corresponding water pollution hazard categories, special conditions, representative water quality monitoring site, and date of licence variation into Schedule 1:

   "Compartments Description

   Compartments 305-309 & 314-316
   Toonumbar State Forest No. 343

Water Pollution Hazard Categories

Water Pollution Hazard Category	Slope Ranges (degrees)
1	Less than or equal to 7 for skidder use only.
2	Greater than 7 and less than or equal to 30 for skidder use only.
3	Not applicable.
4	Not applicable.

Proportion of dispersible soils: less than 10% A horizon
greater than 10% B horizon

Special Conditions

Special conditions are those conditions contained in the harvesting plan for compartments 305-309 & 314-316, Toonumbar State Forest No. 343, prepared by State Forests of NSW, received by the EPA on 15 January 1997, and as amended by:

1. addendum 1 received by the EPA on 31 January 1997; and

2. addendum 2 received by the EPA on 4 February 1997.

Water Quality Monitoring Site

To be determined

Date of licence variation

7 February 1997."

FOR ACTION OR NOTING BY		
ORIGINATOR	SB	7/2/97
1. MWCP		7/2/97
2.		
3.		
4.		

NEIL SHEPHERD
Director-General

Per .....
Geoff Noonan
Manager - Waters &
Catchments Policy
WATERS AND CATCHMENTS
(by Authorisation)

337app-KG

FACSIMILE TRANSMISSION

To	Dr. Neil Shepherd, Environment Protection Authority P O Box 1135 CHATSWOOD NSW 2057		
Attention	Mr Geoff Noonan Catchments Branch	**Date**	7 February 1997
Your Fax		**Our Fax**	(02) 9980 7042
From	Kris Gounder Forest Planning Branch	**Phone**	(02) 9980 4217 (015) 271 625
No of Pages	1 (including this cover page)		

STATE FORESTS

State Forests of New South Wales
Building 2
423 Pennant Hills Road
Pennant Hills NSW 2120
Phone (02) 980 4100

RE: NOTICE UNDER SECTION 17D(3) OF THE POLLUTION CONTROL ACT 1970

In terms of Clause 13(b) of the Pollution Control Regulations, State Forests of New South Wales hereby notifies you that no appeal will be made against EPA's decision to vary Licence No. 4017 on 7 February 1997 to include the following areas:

Compartment No.	State Forest	Managenent Area
305 - 309 & 314 - 316	Toonumbar	Urbenville

for **KRIS GOUNDER**
for Manager
Forest Planning

For State Forests Use Only (Page 1 of 3)

District Forester: Urbenville

As required under the above legislation we advised EPA about our intention not to appeal against this Licence amendment **on 7 February 1997**. Accordingly you may start logging these compartments **on 9 February 1997**.

Manager, Forest Planning

HARVEST PLAN DESK AUDIT CHECKLIST

Register No: 1100 Date Received: 15 / 1 /199 7

State Forest: TOONUMBAR Compartment/~~Age Class~~ CPTS: 305-309, 314-316

District: URBENVILLE State Forest No: 343

Region: NORTHERN ~~Harvest~~/Thinning: THIRD THIN

Forest Type: ~~Native Forest~~/Native Plantation/Softwood ~~Plantation~~* (delete)

WATER POLLUTION HAZARD CATEGORY

Factor	Provided Yes	Provided No	Relevant Yes	Relevant No	Comment
R	✓				R = 3320.
K	✓				K = .03.
S					as factored by SOILOSS 5.1
L					L = 20 M
C	✓				C =

Soil Sampling personnel named and approved: J. CLARIDGE (Yes/No)

CALCULATION OF WATER POLLUTION HAZARD CATEGORIES

1. Calculation provided ~~YES~~/~~NO~~
2. Verified against SOILOSS YES/~~NO~~
3. Appropriate WPHC assigned ~~YES~~/NO
4. Slopes associated with WPHC YES/~~NO~~
5. % Compartment per WPHC YES/~~NO~~

Soil Unit 1: ALL CPT

	% Cpt	Slope (°)	Catchment Size
WPHC 1	20	0-7	
WPHC 2	80	>7-≤30	
WPHC 3			
WPHC 4			

Soil Unit 2: _____(if applicable)

	% Cpt	*Slope (°)*	*Catchment Size*
WPHC 1			
WPHC 2			
WPHC 3			
WPHC 4			

Soil Unit 3: _____(if applicable)

	% Cpt	*Slope (°)*	*Catchment Size*
WPHC 1			
WPHC 2			
WPHC 3			
WPHC 4			

PROPORTION DISPERSIBLE SOIL

Soil Unit 1: Treated as dispersible EAT 1(2) for subsoil.

A Horizon % D: _____ x % C: _____ / 100 = _____
B Horizon % D: _____ x % C: _____ / 100 = _____

Soil Unit 2: (if applicable)

A Horizon % D: _____ x % C: _____ / 100 = _____
B Horizon % D: _____ x % C: _____ / 100 = _____

Soil Unit 3: (if applicable)

A Horizon % D: _____ x % C: _____ / 100 = _____
B Horizon % D: _____ x % C: _____ / 100 = _____

REPRESENTATIVE WATER MONITORING

Representative Water Monitoring Site: To be Determined State Forest

Annual rainfall:_____ Geology:_____

Forest Type:_____

HARVEST PLAN DESK AUDIT CHECKLIST

Condition	Condition	Comply	Comment
1 b	**Site Specific conditions** Attached site specific conditions to harvesting plan		
6	**Minimum protection widths for drainage line in native forests** Any prescribed streams, swamps and wetlands	NIL	Pg 7
7	Any major water storages present	NIL	"
9 (1 c)	Minimum protection widths Show filter strips on harvesting plan map	Y	Map
~~9 (2)~~	~~Show protection strips on harvesting plan map~~		
10	Prescriptions for marking F, P, and B strips in the field		
20	**Operations within Native Forest Protection strips** Person responsible for identifying F strips in the field		→ Trees marked for removal.
22	**Operations within Native Forest Buffer strips** Person responsible for identifying P strips in the field	Y	Pg 20.
24	Specifications of techniques for minimising soil exposure and that any disturbance will cause no channelised flow in buffer strip	Y	Pg 20.
25	**Minimum protection widths for drainage feature in native plantations** (as per 6 and 7)	N/A	
32	**Operations within Native Plantation Protection strips** (as per 20)	↓	
33	**Operations within Native Plantation Buffer strips** (as per 22 and 24)	↓	

HARVEST PLAN DESK AUDIT CHECKLIST

Condition	Condition	Comply	Comment
34	**Minimum protection widths for drainage feature in Softwoods Plantations** (as per 6 and 7)	Y	Pg 19
40	**Operations within Softwood Plantation Filter Strips** Person responsible for determining 5 metre machinery zone	Y	Pg 19
46	**Operations within Softwood Plantation Buffer Strips** (as per 22 and 24)	Y	Pg 20.
47	**Road design, construction and maintenance** Specify techniques for the road design, construction and maintenance	NIL	
48	Proposed road locations are shown on harvesting plan map	Y	
49	Maximum slopes for road construction Specify techniques for road stabilisation within 6 months of construction for roads built on slopes > 30 °	NIL	
53	**Road Clearing** Specify techniques for clearing areas adjacent to roads with minimal disturbance to groundcover and topsoil and with 70% groundcover attained with 12 months	NIL	
57	**Borrow Pits and Gravel Pits** Specify techniques for 1. construction of stable batters 2. stabilisation at the completion of operations	No	- specify

HARVEST PLAN DESK AUDIT CHECKLIST

Condition	Condition	Comply	Comment
60	**Road Batters** Specify road batter stabilisation techniques	Y	Pg 9
63	**Road Drainage** Specify road drainage structures to be used and techniques for: 1. conveying peak flow in 1:5 year event 2. diverting water onto stable surfaces 3. minimising unchecked flow of water from table drains directly to watercourses and drainage lines, snig tracks and log dumps 4. discharging onto surface or structure which provide efficient sediment trapping	N	must specify
71	**Crossing of drainage features** Specify location and type of crossings at drainage features	Must	give more info.
78	**Road no longer required** Specify techniques to be used to stabilise roads that are no longer used	NIL	
81	**Dispersible Soil** Specify techniques used to protect roads and dispose of spoil that is dispersible	NIL	New roading.
89	Snig Track Construction Specify criteria for ensuring that snig tracks are located and constructed where they can be drained effectively	Y	

HARVEST PLAN DESK AUDIT CHECKLIST

Condition	Condition	Comply	Comment
99	**Snig Track Drainage** Specify techniques to: 1. conveying peak flow in 1:2 year storm event 2. diverting water onto stable surfaces 3. minimising unchecked flow directly to watercourses and drainage lines, snig tracks and log dumps 4. divert water at a velocity which minimises damage to the structure	N	must specify -
109	**Downhill snigging** Specify measures to prevent concentrated water flow where downhill snigging occurs	Y	Pg 23
112	**Snig Tracks and Dispersible Soil** Specify measures to protect dispersible soils	No	must specify
115	**Log Dumps** Specify location of log dumps on harvesting plan map	Y	Map
119	**Specify techniques for:** 1. drainage of log dumps during and at completion of operation 2. Log dumps being left in a stable condition at the completion of operations	N Y	— specify pg 26.

Condition	Condition	Comply	Comment
125	**Burning** Specify key and strategic and operational details of burning: 1. Objective of burn 2. Method of ignition 3. Preferred season of burn	N/A	

Additional Harvesting Plan Requirements

1. Appropriate Variation Conditions (Condition 3 of the Harvesting Plan) Yes/~~No~~
2. Appropriate SFO Authority Conditions (Condition 5 of the Harvesting Plan) Yes/~~No~~
3. Canopy Gapping Conditions ~~Yes~~/No

Sustainable Forest Management Branch

Phone No. (02) 97955381

STATE FORESTS
MANAGING · CARING · SUSTAINING

To	District Forester - Urbenville / A/Marketing Forester (K.Petty)
From	Forestry Liaison Officer - Environment Protection Authority
Date	4 February 1997
Subject	HARVESTING PLAN TOONUMBAR 305-309, 314-316

The harvesting plan and amendment for Toonumbar 305-309, 314-316 has been examined by the Environment Protection Authority (EPA). The EPA have requested alterations. Please implement any possible alterations requested so that an amended plan can be submitted to the EPA. Any requests unable to be complied with or considered unreasonable should be presented to Robert Towler. Any amended pages must be forwarded to State Forests, Forest Regulation Unit (attention Kris Gounder), for consideration with the original plan.

Amendments requested are:-

1. *page 6. Part 2, description 6(e), slope.*

   The EPA have requested that we specifically describe if any slopes exceed 30^0 within the planning unit? Please note that with the current wording the EPA consider that we could still have slopes greater than 30^0 in the other 15% of the area. Please insert a definitive description on maximum slope. Suggested wording is
   'No slopes greater than 30^0 where identified during the planning process.'

2. *page 10. Part 2, description 7(a), soil erosion and water pollution hazard categories, table 2.*

   The EPA request that we edit the SE/WPHC value, for slope class >30, from '3' to 'NA'.

3. *page 24. Part 4.4(e), roads.*

   The EPA request we improve the wording in b) to prescribe practices for minimising unchecked flow. Suggested wording is
   'minimise the unchecked flow of water from onto extraction tracks, snig tracks or log dumps by constructing roll over cross banks or mitre drains immediately above the feature consistent with haulage practicalities (outlets must be onto stable vegetation or harvest debris); and'

In preparing the amendments the preparing officer should consult with the Liaison Officer before final amendments are dispatched to EPA.

Compliance with this request does not constitute satisfaction by the EPA with harvesting plan GMA CUT1/96.

Russell Cowgill
for
David Brand
Branch Manager
Sustainable Forest Management

cc
Operation Manager
Northern Region

Sustainable Forest Management Branch

Phone No. (02) 97955381

STATE FORESTS
MANAGING · CARING · SUSTAINING

To	District Forester - Urbenville / A/Marketing Forester (K.Petty)
From	Forestry Liaison Officer - Environment Protection Authority
Date	28 January 1997
Subject	HARVESTING PLAN TOONUMBAR 305-309, 314-316

The harvesting plan for Toonumbar 305-309, 314-316 has been examined by the Environment Protection Authority (EPA). The EPA have requested alterations. Please implement any possible alterations requested so that an amended plan can be submitted to the EPA. Any requests unable to be complied with or considered unreasonable should be presented to Robert Towler. Any amended pages must be forwarded to State Forests, Forest Regulation Unit (attention Kris Gounder), for consideration with the original plan.

Amendments requested are:-

1. *page 6. Part 2, description 6(e), slope.*

   The EPA have requested if there are any areas greater than 30^0 within the planning unit? If there are areas greater than 30^0 in the planning unit they must be indicatively marked on the operational map.

2. *page 8, 19. Part 2, description 6(h), use of existing plantation roads.*

   The EPA request further description of the lower section of 305 Road near the drainage line. Importantly the EPA are interested if the road is within the filter strip, stability of outlets, sufficient sediment catching length or materials and any direct road drainage into the bed and banks of the drainage line.

   The EPA request that we prescribe techniques on the protection of dispersible sub-soil where we undertake gravel operations. Please document our practices. I anticipate that we minimise or prescribe no damage to batters, gravel table drains, and sow batters. On disturbed batters you may consider hay mulch, leaf mulch or possibly top soil before sowing.

   If no gravel pits or borrow pits are required then insert as an additional stanza 'No gravel pit or borrow pit is required within this harvesting unit.' or similar

3. *page 10. Part 2, description 7(a), soil erosion and water pollution hazard categories, table 2.*

The EPA request that we edit the WPHC value for slope class >30 from '3' to 'NA'.

4. *page 10. Part 2, description 7(a), dispersibility.*

For the A horizon value insert '<10%'.
For the B horizon value insert '>10%'.
In the last sentence edit 'soil' to 'sub-soil'.

5. *page 13. Part 3.5, variations and amendments to this harvesting plan.*

In the first stanza insert after Condition 5.1(c) 'or consistent with condition 24A of the Pollution Control Licence'.

In the second stanza insert after Condition 5.1(c) 'or consistent with condition 24A of the Pollution Control Licence'.

6. *page 15. Part 3.10, distribution, Environment Protection Authority.*

Edit 2 copies to '3'.

7. *page 18. Part 4.4(b), approved timber harvesting and extraction method.*

Edit or delete the point on 'all snigging will be up hill' as the map indicates down hill snigging in parts of compartment 315 and to dump B. We have also listed down hill extraction techniques on page 23.

8. *page 18. Part 4.4(c), slope limits for the area.*

The EPA request that we delete this sentence and instead replace with the standard table due to the steep slopes within the planning unit and similarity of the plantation species with riparian vegetation.

9. *page 19. Part 4.4(d), drainage feature protection.*

For table 4: delete WPHC3 rows or change slope values to 'NA';
change WPHC1 slope values to '0 ≤ 7';
change WPHC2 slope values to '> 7 ≤ 30'.

In the second stanza, delete the first sentence as it tends to confuse and is adequately prescribed with table 4.

10. *page 21. Part 4.4(e), felling and extraction from drainage depression buffer strips.*

Delete this stanza as we have already prescribed measures on page 20. For format consistency, the EPA suggest that the first part on page 20 *drainage*

My anticipation is that a temporary cross bank drain is constructed within 40 metres of the crossing at the completion of extraction each day until final completion when permanent drains are installed.

13. *page 23. Part 4.4(e), roads.*

Please prescribe to the contractor that haulage is not permitted on the lower sections of 305 Road.

The EPA request that we edit the title to 'existing roads' as the prescriptions apply to current roads and no new roads are proposed.

We must prescribe techniques to meet b), ie minimise unchecked flow. Please document your practices. The usual technique is to ensure drainage immediately above the feature consistent with haulage practicalities.

14. *page 24. Part 4.4(e), location of log dumps/log assembly areas.*

The EPA request that we prescribe how run off is to be dispersed. Please document your practices. I anticipate that we use slash and bark at drain outlets.

To clearly document our practice in dispersible sub-soil please prescribe 'Dumps must not be stripped of top soil prior to use.' or similar

15. *page 27. Part 5.1(c), SFOs authority.*

Edit point (f) to
'location and type of temporary drainage line crossing by snig/extraction tracks'

16. *page 27-28. Part 5.3, daily and fortnightly reporting.*

Reword point (i) as
'instances where crowns, logs or substantial debris are not removed from watercourses;
'instances where crowns and logs are not removed from drainage lines'.

Insert these additional reporting events
'non removal of spoil from bed and banks at road or snig/extraction track crossings;
situations were road or snig/extraction track crossing stabilisation has not occurred within five days'.

In preparing the amendments the preparing officer should consult with the Liaison Officer before final amendments are dispatched to EPA.

depression is shifted to the section on page 21 *felling and extraction from drainage depression buffer strips.*

11. *page 22. Part 4.4(e), track drainage.*

Edit title to 'snig track drainage'.

Prior to table 5 we require a prescription
'That where drainage by the above techniques cannot be achieved, then drainage must be constructed that does not exceed the distances in Table 5.' or similar

We must prescribe the techniques to achieve drainage within the limits of b), c) and d). Please document your practices. The usual techniques are to ensure outlets are only slightly off the contour and are onto undisturbed vegetation or logging slash. To minimise unchecked flow into watercourses and drainage lines, or onto roads and dumps we usually place a drainage structure above the feature that has an outlet onto a filtering area.

The EPA request that we prescribe the techniques to protect dispersible sub-soil during extraction. These techniques are listed in PCL schedule 4 conditions 114 and 116.

12. *page 23. Part 4.4(e), snig track crossings of drainage features.*

A new section must be inserted.

Please describe the site and prescribe any instructions for the five extraction track crossings identified on the map between dumps C & D, between dumps C & B and in compartment 315 to access dump R. Parameters that should be considered are: 3 snig track crossings in cpt 315 to dump R.
3 road crossings from dumps B, C & D.
KEVIN PETTY 29/1.

a) location;
b) type;
c) permanence of water flow;
d) any stabilising features existing or proposed;
e) approach drainage proposed (including distance guideline, type and any special outlet control);
f) an assessment as stable or unstable if existing.
g) any technique to minimise deposition of spoil during construction if a bridge or culvert;
h) control of pavement fill if bridge or culvert;
i) protection of dispersible sub-soil;
j) any reshaping of bed and banks;
k) stabilisation of bed and banks;
l) sowing rate;
m) stabilisation assessment interval.

R

If other temporary snig track crossings are possible then we must include a guideline on their establishment, protection of dispersible soil and stabilisation.

Compliance with this request does not constitute satisfaction by the EPA with harvesting plan GMA CUT1/96.

Russell Cowgill
for
David Brand
Branch Manager
Sustainable Forest Management

cc
Operation Manager
Northern Region

EPA

ENVIRONMENT PROTECTION AUTHORITY

FROM:

MR PAUL O'KEEFE
WATERS AND CATCHMENTS SECTION, QUEANBEYAN

Ph: (06) 2993330
Fax: (06) 2996876

GROUND FLOOR, ROBERT LOWE BUILDING
UNIT 2, 30 LOWE ST
PO BOX 622
QUEANBEYAN NSW 2620

FACSIMILE TRANSMISSION

TO: Russell Cowgill

FAX NO: 02 9795 5362 DATE: 31.1.97

MESSAGE: Toonumbar 305....
has not properly addressed requests for further info.
As per your request needs to address further;
- point 1
- point 3
- point 13 Your third part of this point
- point 12 See my comments attached

NUMBER OF PAGES TO FOLLOW: 2
ORIGINAL DOCUMENTS - WILL/WILL NOT FOLLOW

ANY PROBLEMS RECEIVING THIS TRANSMISSION CALL (06) 2993330

TOONUMBAR 305...

1) Drainage feature Crossings

- In amendment to plan, stated on page 24 that 5 big track crossings access dump R.
  Not sure which crossings are being referred to.
  Also states that no other crossings anticipated for construction.

  EPA still needs information on crossings

  a) between log dumps C + B (1)
  b) " log dumps C + D (2)

- ~~Not~~ Amendment has section on big track crossings.
- New section required on Road crossings.

  Should be described as per Schedule 2 -
  Any maintenance should be described (instructions to SFO/contractor)

  Note: these crossings were requested in original request for information.

Note: Format Required

as per schedule 2.

(a) Part 2 should have description of all existing road crossings and proposed road crossings construction.

(b) Part 4 should have ~~dump~~ instructions for existing road crossings and proposed road crossings. All should be titled separately.

Staff Performance Evaluation & Development Scheme

STAFF AND CAREER DEVELOPMENT NEEDS FORM

Subject Officer's name: ..... Phone: .....

Position: .....

Section & Branch/Region: .....

Reporting Officer's name: ..... Phone: .....

Review Period from: **1 Jan 1997** to **31 Dec 1997**

PLEASE list all items in order of PRIORITY. Where the need is by a specific date, list the date.

1. Staff development activities/opportunities to support the Performance Plan (List job related *knowledge, skills* and *experience* [not courses] for which training and development is sought).

.....

.....

.....

.....

.....

2. Career Development activities/opportunities (List career related *knowledge, skills* and *experience* [not courses] for which training and development is requested).

.....

.....

.....

.....

.....

.....

3. I confirm the Staff and Career Development needs described above.

Signed: ..... Date: .....
Subject Officer

Signed: ..... Date: .....
Reporting Officer

The completed form is to be retained by the Reporting Officer and a copy provided to the Subject Officer. The Reporting Officer is responsible for forwarding a copy of the completed form to the Staff Performance & Development Section.

TOONUMBAR

(2) Road Drainage

· Still have not satisfied condition #63 (c)
i.e need to specify technique.

Log dumps

(3) Must specify areas > 30° in Compartments.
(Not only net harvest area)
This must be shown on map.

1) Table 2 page 10 (and table 3)

>30° is not WPHC 3 - delete. No

2) Are there areas > 30° within compartment. Must show on Map. (not only net harvest area). No

3) Page 18 4.4 (c)

Slope limits for area

"No restrictions. All area available for harvesting"

Delete this statement."

Must include - slope limit for
- harvesting
- snig track grade
- sideslope for snig track
- road grade
- side slope for road.

4) Table 4 Page 19

Delete WPHC 3.

Change WPHC 1 from 0-5 to 0-7°

WPHC 2 from 5-23 to >7-≤30°.

Column for should be deleted.

No WPHC 3.

4) con't

~~State underneath table that~~

Paragraph under table 4 should be deleted as it makes no sense as it contradicts table 4.

5) Map: how close is road #305 to filter strip? Is it parallel to filter strip?

6) Page 22: should state that if (a)-(c) cannot be achieved then drain according to table 5.

7) Specify techniques to achieve #101 of PCL.

8) Roads:
~~Title~~ Title should be existing roads.
specify techniques to achieve #63 of PCL No

9) Satisfy condition # 115 of PCL

10) Any gravel / borrow pits ?

11) Existing crossings

Specify according to Schedule 2.
for crossing between log dumps D + C, No
log dumps C + B and in Cpt 315.
~~Are the natural earth crossings~~

12) Snigging

State on page 18 all snigging uphill.
Page 9, snigging downhill to dump R.
Clarify.

13) Log Dumps

Specify technique for condition #120 of PCL.
Will topsoil be stripped?
If so what about desperible soil ?

~~14) Natural earth crossings
Specify stabilization method when truck movements remove grass cover. What is desperible material is exposed due to truck disturbance.~~

14) Specify stabilization techniques to be used for natural surface crossings as per schedule 2.

Also techniques to cover any dispersible material exposed on natural surface crossings.