

Harvest Plan Operational Map

Compartment 2135

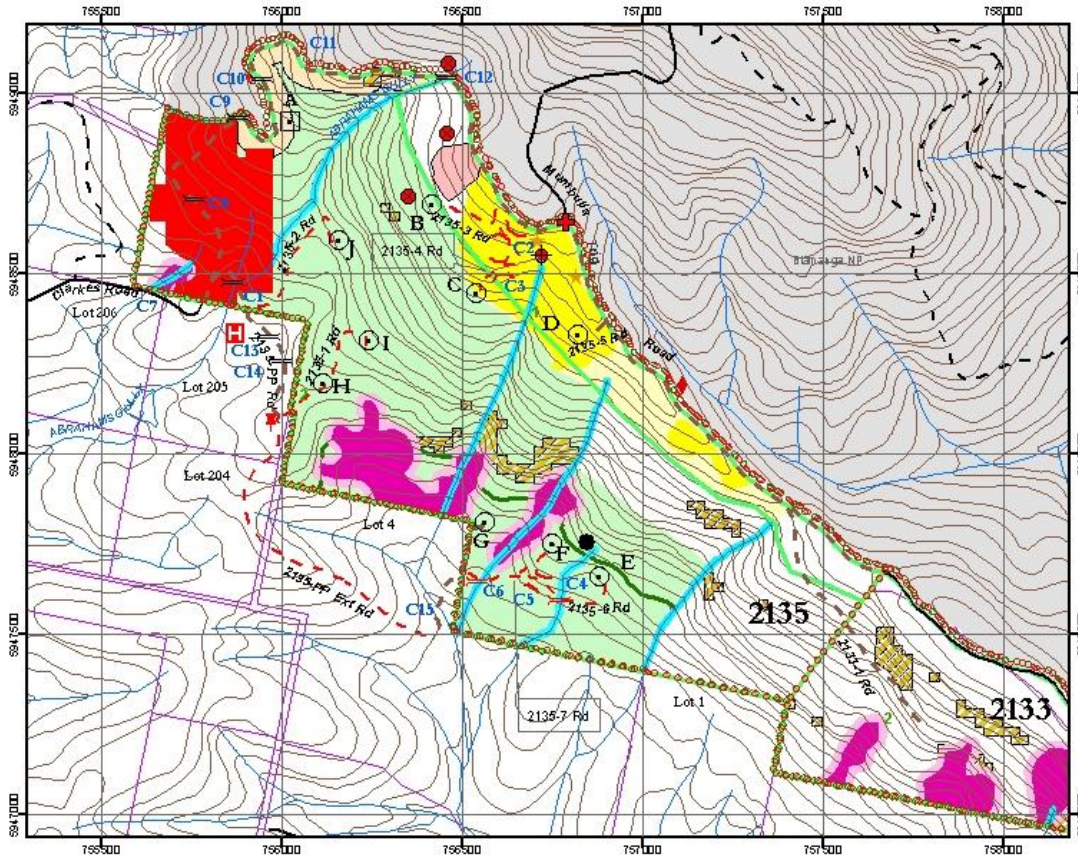
Mumbulla State Forest No 605

Southern Region - Native Forests
Map Sheet: Brogo 8824-I-N





Scale: 1:15,000
Contour Interval 10m



<p>BOUNDARIES</p> <ul style="list-style-type: none"> --- State Forest Boundary --- Compartment Boundary --- Coupe Boundary --- 160m Altitude Contour Line <p>ROADS</p> <ul style="list-style-type: none"> --- Major Forest Roads --- Minor Forest Roads --- DECC Licenced Existing Road --- DECC Licenced New Construction <p>NET HARVEST AREA</p> <ul style="list-style-type: none"> Available for Thinning (high stocking) Available for Thinning (low stocking) FMZ 3bV Modified Prescriptions 50% Canopy Retention (50m) <p>STREAM EXCLUSION ZONES EPL (IHL 1& 2) & TSL</p> <ul style="list-style-type: none"> --- Mapped LIC Drainage --- 1st Order (10m each side Thinning Only) --- 1st Order (15m each side Integrated Only) 	<p>DUMPS & CROSSINGS</p> <ul style="list-style-type: none"> ⊙ Temporary Dry Dump ⊙ Temporary Wet Dump C1 Crossing --- New Drainage Feature Crossing --- Existing Drainage Feature Crossing <p>NON HARVEST AREA</p> <ul style="list-style-type: none"> --- National Park Estate --- Old Growth Forest Communities --- Rainforest (with 20m Buffer) --- Private Freehold --- Non Harvest Area --- Non Harvest Area --- IHL 4 (Slopes 30+) <p>MISCELLANEOUS</p> <ul style="list-style-type: none"> ● Stabilised Mass Movement (GR 756844/5947756) 	<p>FLORA RECORDS</p> <ul style="list-style-type: none"> ⊕ Coreea bauerlenii (Chets Cap Correa) <p>FAUNA RECORDS</p> <ul style="list-style-type: none"> ● Sooty Owl ★ Gang Gang Cockatoo ◆ Yellow-bellied Glider (Observed Record) <p>SAFETY</p> <ul style="list-style-type: none"> ⚠ Dangerous Tree ⊕ Ambulance Meeting Point ⊠ Emergency Helipad
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0 100 200 400 600 800 Meters

APPROVED

Regional Manager Approval Date: 16/03/2010
Date: 03032010

HP_ED_2133_2135_10

FORESTS N.S.W.

SOUTHERN REGION: EDEN



HARVESTING PLAN HP_ED_2133_2135_10

Compartments 2133 & 2135

1: SAFETY CONSIDERATIONS

1.1: EMERGENCY PLAN INFORMATION.

(a) **Mobile Phone reception on work site:**

Next G Good Poor Nil Digital ? Good Poor ? Nil

Nearest reliable reception: High points within the compartments and along Mumbulla Trig Road.

(b) **Forests NSW Radio from work site:**

Channel No: .
Call to: .
Call sign from:

Contractor Radio at work site:

UHF Channel No:
Contractor No:
Call to Bush Boss:

(c) **Emergency meeting point for ambulance:**

Clarks Road and Mumbulla Trig Road Junction.
1:100000 map sheet: Bega.
MGA zone: 55.
MGA Grid reference: E756783 N5948644.
Lat/Long for GPS: 36° 34' 23"S 149° 52' 10"E.

(d) **Closest Helicopter Landing Place:**

1:100000 map sheet: Bega.
MGA zone: 55.
MGA Grid reference: E755911 N5948354.
Lat/Long for GPS: 36° 34' 33"S 149° 51' 36"E.

(e) **Procedure for obtaining Ambulance assistance:**

Dial "000" OR Call Eden Forestry Office for Ambulance assistance.
Dial "112" only as an alternative to "000" if you have a GSM digital mobile phone and you are outside your own provider's GSM network coverage area.

"000" Operator Question.

Response

- | | |
|--|---|
| 1. Police, Fire, Ambulance? | Ambulance Wollongong. |
| 2. <u>Suburb</u> (State Forest name):
(Nearest town or named locality):
(Nearest Ambulance station): | Mumbulla.
Greendale.
Bega. |
| 3. <u>Address</u> : (Nearest named State forest road): | Mumbulla Trig Road. |
| 4. <u>Nearest Road Junction</u> : | Clarks Road and Mumbulla Trig Road. |
| 5. <u>Local Government Area</u> : | Bega Valley Shire Council. |
| 6. <u>Nature of the problem</u> : | Give details of accident, number and condition of casualties. |

7. Where is the accident: Work site location – (Centre of the compartments).

MGA Grid reference: Compartment 2133: E739173 N5884686.
Compartment 2135: E756828 N5947968.

Lat/long for GPS: Compartment 2133: 36° 34' 45"S 149° 52' 13"E.
Compartment 2135: 36° 35' 41"S 149° 53' 44"E.

8. Directions to navigate from Ambulance Station to meeting point:

Directions from Bega:

- Head north along Princes Highway for approximately 9.6 km to Greendale Road junction.
- Turn right onto Greendale Road for approx. 1.6km to Jews Creek Road Junction.
- Veer left onto Jews Creek Road for approx 2.5km to Clarkes Road junction.
- Turn right onto Clarkes for approx 4.4km to Mumbulla Creek Road intersection.

9. Injuries?: Give detailed information about the condition of the casualty.

10. Call back No: Give your Mobile Number
or Eden Office: 1300880548.

11. Name of Reporter: Give own name.

1.2: SITE SPECIFIC IDENTIFIED HAZARDS.

Assessment of existing hazards was undertaken at the time of planning. These hazards are in the attached table and where appropriate, control strategies have been applied. Where no control strategy has been described, the contractor must develop appropriate strategies as part of the contractors Safety Management Plan. A copy of the hazard assessment and control strategies is provided to assist in the development of the contractors Safety Management Plan for this harvesting area.

Identified hazards requiring risk assessment and control strategy in Safety Management Plan

IDENTIFIED HAZARD	SUGGESTED CONTROL STRATEGY
1. Adjoining roads of various traffic levels	Warning signs at intersections, road closure and traffic control measures.
2. Overhead hazards associated with dumps	Assess overhead hazard within two tree lengths (based on the tallest surrounding trees) of the dump. Assess risk, & if necessary remove hazard or relocate dump site.
3. Hazardous or dead trees	Refer to FNSW Safety Standard 1.3.9. Assess area within two tree lengths of work site. Assess risk, mark any Distinctly Dangerous Trees with the symbol “Ø↑” and if necessary remove hazard or move work site. Use machinery to assist with hazard removal if possible. Contractor is responsible for implementing control strategies during harvesting.
4. Dust from passing vehicles along dirt haulage routes.	Restrict speed to minimise dust generation, slow down when passing vehicles. Turn on driving and hazard lights to increase visibility.

5 Bus stop	<ul style="list-style-type: none"> The junction of Princes Highway and Greendale Road is a bus stop location for Bega Valley Shire Coaches. Particular care must be exercised on weekdays around the following times 6am, 6:30am, 7am, 8:30am, 10:15am, 2pm, 3:40pm, 4:45pm, 5:30pm and 6pm. Haulage vehicles must take particular care around these times for private vehicles and pedestrians using Greendale Road, Jews Creek Road and Clarkes Road.
6 Bus Route	<ul style="list-style-type: none"> Greendale Road and Jews Creek Road is used as a school bus route. Particular care must be exercised on weekdays around the following times 7.30am to 8.30am and 3.30pm to 4.30pm. Haulage vehicles must take particular care around these times for school buses, private vehicles and pedestrians using Greendale Road, Jews Creek Road and Clarkes Road.

The planned locations for 1 and 2 are shown on the attached Operational Maps.

a Traffic management/road closures

- The logging contractor is responsible for traffic control on all roads when felling is within two tree lengths (based on the tallest surrounding trees) of a road or extracting on roads or loading is occurring within 10 metres of a road. The contractor must ensure that Clarkes Road, Mumbulla Trig Road, Mumbulla Creek Road and all other internal forestry roads are closed to all traffic when trees within two tree lengths of Clarkes Road, Mumbulla Trig Road, Mumbulla Creek Road and all internal forestry roads are being felled.
- Forests NSW Supervising Forester must be notified well in advance of any proposed road closures along Clarkes Road, Mumbulla Trig Road and Mumbulla Creek Road. The duration of closure on Clarkes Road, Mumbulla Trig Road and Mumbulla Creek Road must be kept to a minimum to accommodate general public access on these roads (Refer to page 11).**
- In the event that felling of trees occurs within two tree lengths (based on the tallest surrounding trees) or loading is occurring within 10 metres of Clarkes and/or Mumbulla Trig and/or Mumbulla Creek Roads then RTAs' Traffic Control at Work Sites TCP 83 attached to this harvesting plan must be implemented.
- In the event Clarkes and/or Mumbulla Trig and/or Mumbulla Creek Roads are closed. Forests NSW Supervising Forester must notify the relevant National Parks Office regarding the duration and location of the road closure. Traffic control signage for "road closures" or "short delays" should be placed in strategic locations to inform the general public of the road closures. Traffic control signage should be placed in such a location that allows large vehicles with trailers etc enough room to turn around safely i.e. entrance to Greendale Road.
- Warning of timber harvesting operations must be **displayed 200 metres either side** of all thoroughfare road approaches leading to areas where harvesting operations are in progress.

- The junction of Princes Highway and Greendale Road is a bus stop location. Particular care must be exercised on weekdays around the following times 6am, 6:30am, 7am, 8:30am, 10:15am, 2pm, 3:40pm, 4:45pm, 5:30pm and 6pm. Haulage vehicles must take particular care around these times for private vehicles and pedestrians using Greendale, Jews Creek Road and Clarkes Road.
- Greendale Road and Jews Creek Road is used as a school bus route. Particular care must be exercised on weekdays around the following times 7.30am to 8.30am and 3.30pm to 4.30pm. Haulage vehicles must take particular care around these times for school buses, private vehicles and pedestrians using Greendale Road, Jews Creek Road and Clarkes Road.
- Particular care must also be exercised for private vehicles using Mumbulla Trig Road and Mumbulla Creek Road as these road are used to access Mumbulla Creek Falls Picnic Area within Biamanga National Park.

b Supervision of 'operator in training'

All new operators entering the work site must be inducted by the reading of the Harvesting Plan and the Site Safety Plan and hold all relevant licences and accreditations. No person is permitted to commence work unless they have been adequately trained and accredited. The training must give instruction in the performance of the work, instruct as to any dangers associated with that work and in any safety precautions which ought to be taken. Field and bush supervisors must ensure that an employer does not permit an untrained employee to operate, without competent supervision, any power driven tool, machine or equipment.

1.3 Site visitors

(a) Authorised

i) All authorised visitors to active timber harvesting/roading operations must wear the following personal protection equipment:

- an approved safety helmet
- suitable heavy duty footwear, with firm ankle support and non-slip soles
- approved high visibility clothing
- eye and ear protection if appropriate

ii) Immediately upon arrival at an active timber harvesting/roading operation, visitors must report to the Supervising Forest Officer (SFO) or bush supervisor who will determine points from which operations can be safely viewed.

iii) The following minimum safety distances must be observed while operations are active:

- Manual tree felling - at least 2 tree lengths (based on the tallest surrounding trees).
- Log dump operations – 12 metres from the working area (edge of dump perimeter)
- Mechanical harvesting – 2 tree lengths (based on the tallest surrounding trees) and when the driver is advised.
- Active snig track – at least 2 tree lengths (based on the tallest surrounding trees).
- Road & crossing maintenance &/or construction – at least 2 tree lengths (based on the tallest surrounding trees).

(b) Unauthorised

i) All unauthorised visitors to active timber harvesting/roading operations must not approach within 100 metres of a person operating timber haulage or harvesting equipment (clause 63(1)(a)) or interfere with such equipment (clause 63(1)(b)) Forestry Regulations 2009. In addition unauthorised visitors must wear the personal protection equipment outlined in 1.3(a)(i) above.

ii) Failure to observe the above guidelines will result in the following procedure:

- All operations to cease immediately.
- Unauthorised visitors to be advised that they are in contravention of clause 63(1)(a) or 63(1)(b) of Forestry Regulations 2009 and to leave the site or move outside the 100 metre restricted area immediately.
- Notify the Forests NSW Office of unauthorised visitors.

2: AREA IDENTIFICATION

<i>Management Area:</i>	Eden.
<i>State Forest:</i>	Mumbulla No. 605.
<i>Management Section:</i>	Quaama.
<i>AFS Certification:</i>	AS 4708:2007. ISO 14001
<i>Compartment(s) Numbers:</i>	2133 and 2135
<i>Cpt 2133 Event Id.</i>	14168.
<i>Cpt 2135 Event Id.</i>	14169

Table 1: Area of Plan by Logging Coupes (hectares)

Compartment: 2133		
Area of Compartment: 233.1 ha		
	Coupe	Net Area (ha)
Proposed for Thinning	1	14.0
Proposed for Thinning	2	2.0
Proposed for Integrated Harvesting	2	107.5
TOTAL		121.5

Compartment: 2135		
Area of Compartment: 174.7 ha		
	Coupe	Net Area (ha)
Proposed for Thinning	1	16.6
Proposed for Thinning	2	2.7
Proposed for Integrated Harvesting	2	82.8
TOTAL		102.1

3: DESCRIPTION OF PROPOSAL

(a) Integrated Harvesting of Native Forest:

Mixed-age stands dominated by a commercially mature overstorey will be harvested to create regeneration opportunities through integrated harvesting of sawlogs and pulpwood with the retention of trees for future sawlogs, fauna habitat, seed trees, visual maintenance and soil and water protection.

(b) Thinning Harvesting of Regrowth Native Forest:

Overstocked advanced regrowth stands originating from past logging activities and wildfire events will be mechanically thinned under site specific silvicultural regimes aimed at retaining the highest quality future sawlogs. Thinning reduces the number of competing stems in a stand and concentrates the growth potential onto the remaining crop trees. This process will maintain the uniform age structure that characterises regrowth forests.

(c) Roadworks:

The road works required are those associated with this harvesting operation.

(e) Post-harvest Burning:

Post-harvest burning to reduce fuel loads and create a suitable seed bed may be carried out under prescribed conditions. The Post-harvest burning details are contained in Appendix 2.

Post-harvest burning should be confined as far as practicable to the net harvest area. Site specific burning exclusions associated with flora, fauna, cultural heritage, riparian, private freehold and other exclusion zones are explained within the relevant sections of this Harvest Plan and indicated on the Operational Maps.

- Where practicable, snig track patterns should be designed to double as bare earth control lines to prevent fire entering specified exclusion zones i.e. Cultural Heritage sites, private freehold. Where this is not practical, the SFO is to assess the need for a bare earth break to be constructed close to the harvesting exclusion boundary and seek advice and approval from the Harvesting Team Leader for the additional earth works.
- Where this is not practical, the SFO is to assess the need for a bare earth break to be constructed close to harvesting exclusion boundary and seek advice and approval from the Harvesting Team Leader for the additional earth works.

4: FOREST CONDITION & SILVICULTURE

4.1: FOREST TYPE:

Table 2: Compartment Forest Types

Compartments 2133 & 2135	Forest Type (Res. Note 17)
	112 Silvertop Ash
	114 Silvertop Ash - Stringybark
	157 Yellow-Stringybark - Gum

Reference: Baur GN "Forest Types in New South Wales" FC NSW Res. Note No. 17 2nd ed. 1989.
API Forest Typing, 1998.
Pre-harvest Survey Report Compartments 2133 and 2135, Mumbulla State Forest, Forests NSW Southern Region: Eden, 2010.

4.2: SILVICULTURAL OBJECTIVES AND PRESCRIPTIONS:

(a) Silvicultural Prescriptions for Integrated Operations:

Coupe 2 of Compartments 2133 and 2135 are proposed to be harvested under an integrated harvesting system as indicated on the Harvesting Plan Operational Maps.

- Mixed-age mature stands and low merchantability areas will be harvested using a modified shelter-wood silvicultural system. Trees will be retained for fauna habitat, seed supply, further economic growth, visual maintenance and structural diversity. Commercially viable trees not required for any of these purposes will be harvested for sawlogs and pulpwood to create good regeneration opportunities.
- Where practicable, all future sawlog trees, capable of net merchantable increment, are to be retained for a subsequent cutting cycle.

- A minimum of four (4) trees per hectare, in the dominant or co-dominant class, with suitable crowns, shall be retained for seed production. These should include retained habitat and future sawlog trees.
- Seed trees are to be retained around each log dump to assist regeneration of the disturbed area. The number of retained seed trees will be determined by the Supervising Forest Officer (SFO), based on the size of the log dump, but will generally be 3 - 5 trees with healthy, seed producing crowns. These trees are not additional to those specified in the condition above.
- Harvesting disturbance should be concentrated away from retained trees and exclusion zones, to optimise post-harvest regeneration and provide a good seed bed for regeneration. This may be achieved by felling trees or pushing heads into non-commercial trees or stands where it is safe to do so.
- Subject to occupational health and safety considerations, directional felling techniques are to be utilised to minimise damage to retained trees, to avoid hang-ups and to maintain values of reserve areas and drainage lines.

Silvicultural Prescriptions for Thinning Operations:

Areas of Coupe 1 of Compartments 2133 and 2135 are dominated by regrowth stands suitable for thinning as indicated on the Harvesting Plan Operational Maps. Coupe 1 of Compartments 2133 and 2135 will be harvested using a specialised thinning crew. Integrated operations are to be excluded during this harvesting event from Coupe 1 of Compartments 2133 and 2135.

- The principal objective of the thinning operation is to grow high quality sawlogs, over a shorter period, for future harvest. This will be achieved by “thinning from below”, to reduce the number of competing stems in the stand and to concentrate growth potential onto the remaining final crop trees.
- Thinning will aim at a 50 - 60% reduction in the standing basal area. The current standing basal area estimate for the proposed area to be thinned in:
Compartment 2133 is 34 m²/ha.
Compartment 2135 is 46 m²/ha.
- Operational inventory plots established within Compartments 2133 and 2135 during 2000, based on a 55% basal area removal, estimated the merchantable regrowth volume to be removed is:
Compartment 2133 130m³/ha.
Compartment 2135 80m³/ha.
- A retention rate aim of 250 to 300 stems/ha of the most vigorous regrowth trees, of suitable form, will be targeted. Where stocking rates and stand quality vary throughout Coupe 1 of Compartments 2133 and 2135, individual stands may be thinned to a minimum acceptable retention rate of 160 stems/hectare. This will only occur with SFO authorisation and will be documented in the SFO copy of the Harvest Plan. Retained stems **must be in the dominant** or best of the co-dominant classes with greatest sawlog potential.
- Thinning will aim to remove this volume from the poorer quality stems of the stand, leaving the most vigorous stems of good form to grow on.
- All current sawlog trees, capable of net merchantable increment, are to be retained for a subsequent cutting cycle.
- Where safe to do so 1-2 mature seed trees are to be retained near each parking/loading bay, where available, to assist in the regeneration of the disturbed area.

5: SPECIAL REQUIREMENT AREAS

(a) Forest Management Zone Classification:

Forest Management Zone 3bV (Visual) is located over the entire area of Coupe 2 of Compartment 2133 and over the entire area of Compartment 2135 as indicated on the Harvesting Plan Operational Maps. The Forest Management Zone 3bV (Visual) area within these compartments forms part of the net harvestable area for this harvesting operation. Harvesting operations within this area must be conducted under the following prescriptions:

- **The visual impact of harvesting operations within these compartments must be monitored daily by the SFO and/or the SFO Supervisor to ensure that the canopy retention prescriptions are achieving the desired outcome of protecting the visual values of this zone.** The SFO and/or the SFO Supervisor are to utilise vantage points along the Princes Highway (particularly from the top of the cut batter on the eastern side of Princes Highway near the speed cameras) and from the front of the water tower located in Bellmore Street Bega. In consultation with the Harvesting Team Leader, the SFO is required to increase the level of canopy retention where the above prescriptions are not adequately maintaining the visual values of this area.
- Where the SFO and/or SFO Supervisor determines that harvesting will not have a visual impact from the above vantage points or from other visual areas within the township of Bega, then authorisation to implement standard tree retention prescriptions is to be obtained and documented by the Harvesting Team Leader.
- All dumps will be constructed within the Forest Management Zone 3bV (Visual) located in Coupe 2 of Compartment 2133 and Coupes 1 and 2 of Compartment 2135 as indicated on the Harvesting Plan Operational Maps. Log Dump size should be kept to a minimum (i.e. 40m X 40m) without compromising safe work practices. Where safe to do so trees should be retained in front of dumps to act as a bare earth screen. The trees retained where suitable should be made up of habitat/recruitment trees or tress that do not comprise sawlog material. This retention is not additional to the tree retention prescriptions included in this plan.
- Where log dumps are located adjacent to Clarks Road or Mumbulla Trig Road where safe to do so trees should be retained between the dump and these roads to act as a bare earth screen.
- A 50m wide strip with a minimum of 50% canopy retention (other than the 3m maintenance zone) will be retained adjacent to Clarks Road, Mumbulla Trig Road and Mumbulla Creek Road as indicated on the Harvesting Plan Operational Maps. This canopy retention is not additional to the tree retention prescriptions included in this plan. Additionally, the harvested materials are to be comprised of sawlogs where possible. Within this zone to facilitate burning bark should be re-spread, logging debris not windrowed and crowns should be cut and compacted to the ground to reduce elevated fuel loads. Logging debris as far as practicable should be placed greater than one metre from retained trees.
- A minimum 50% canopy retention must be achieved on slopes greater than 25 degrees within Coupe 2 of Compartments 2133 and 2135 (See Section 8 Soil Erosion and water Pollution Control).

- Where harvesting occurs on altitudes above 160m within Coupe 2 of Compartment 2133 no more than 50% of the canopy is to be removed and within Coupe 2 of Compartment 2135 no more than 60% of the canopy is to be removed whilst retaining a minimal basal area of 10m² /ha within the net harvest area located above 160m in altitude. Where safe to do so the retained trees should be evenly spaced over the net harvest area, have a healthy crown, be in a DBH size range of 25-40cm (i.e. potential sawlog growers), and can include habitat trees, recruitment trees and suitable seed trees.
- The current standing basal area estimate within stands located above 160m in altitude for Compartment 2133 is 21 m²/ha and Compartment 2135 is 26 m²/ha
- In order to support a safe worksite, retained trees (other than for habitat retention) are to be selected by the tree falling operator in accordance with licence condition & silvicultural guidelines.
- Within Coupe 2 of Compartments 2133 and 2135 standard integrated harvesting silvicultural practices are planned to occur below altitudes of 160m. Refer to monitoring guidelines above. . Additional tree retention may be required as outlined in areas above 160 metres altitude.
- Where safe to do so snig track construction should be constructed on the contour and vertical snig track construction should be avoid as far as practicable.
- To facilitate burning the logging debris produced by removal of trees within the 3m maintenance zone on Clarkes and Mumbulla Trig Road must be deposited on the southern side of these roads, away from retained trees and tree heads, where safe to do so, should be cut and compacted to the ground to reduce elevated fuel loads.
- During hazard reduction burning consideration must be given to fuel moisture differentials, prevailing winds and ignition patterns.

(b) Critical boundaries and private property:

Compartments 2133 and 2135 are bordered to the northern side of Mumbulla Trig Road by Biamanga National Park as indicated on the Harvesting Plan Operational Maps.

- All harvesting activities must not cross this boundary.
- Ensure no build-up of fuel within 10m of the national park boundary in order to assist post-harvesting burning.
- Where it is considered likely that fire applied externally will enter this exclusion zone through natural spread, a carefully planned ignition pattern and sequence should be applied.

Freehold property is located on the entire southern and western boundaries of Compartment 2133 and 2135, as indicated on the Harvesting Plan Operational Maps.

- The freehold property boundary must not be crossed during harvesting operations.
- Ensure no build-up of fuel within 10m of the freehold property boundary in order to assist post-harvesting burning.
- **Where practicable, extraction tracks should be constructed close to the boundaries of the harvested area to act as bare earth breaks around post-harvesting burns. Where this is not practical, the SFO is to assess the need for a bare earth break to be constructed close to harvesting boundaries and, where required the SFO should advise the Operations Forester Eden of this need and estimated works involved. On approval from the Operations Forester Eden the SFO shall engage the contractor to undertake the work concurrent with harvesting, with Forests NSW to be billed appropriately. Where the harvesting configuration does not have suitable machinery to undertake break works, the Operations Supervisor Eden needs to be notified to arrange alternative means of break construction.**
- Prior to commencing hazard reduction burning consideration must be given to fuel moisture differentials, prevailing winds and ignition patterns.
- No harvest disturbance is permitted on private property.
- Harvesting debris must not be left within five metres of the boundary fence lines.
- Any damage to fences must be repaired by the contractor.
- Access roads must be maintained free of debris and in a trafficable state.

(c) Research and Inventory Plots:

An Eden Coastal Permanent Plot (ECPP 2 GR 756714/5948554) is located in the north-western section (east of 2135-4 Rd) of Coupe 1 of Compartment 2135 as indicated on the Harvesting Plan Operational Map.

- A one (1) tree length exclusion zone is to be placed around this plot. The tree length exclusion zone is to be measured from the perimeter of the plot.
- All forestry activities must be excluded from this zone.
- Existing snig tracks, roads, moisture differentials, ignition patterns and constructed hand trails should be utilised to avoid fire encroachment into this zone.

(d) Recreational Site Values: Nil.

(e) Occupational Permits and Grazing Permits: Nil.

(f) Crown Leases: Nil.

(g) Other Special Prescription Areas:

Integrated harvesting operations are authorised in Coupe 2 of Compartments 2133 and 2135 only. Where it is necessary to build snig tracks through Coupe 1 to access timber within Coupe 2 of Compartment 2135, then only those trees on the immediate snig track are to be removed. The number of snig tracks constructed through the advanced regrowth section within Coupe 1 of Compartment 2135 must be kept to a minimal.

The snig track/s constructed through Coupe 1 of Compartment 2135 during the integrated harvesting operation where practical and safe to do so must be used as out rows during the thinning operation.

Where safe and practical to do so trees within the 3m road maintenance zone on Clarkes Road and Mumbulla Trig Road are to be harvested to facilitate road drying. Trees removed from the northern side of these roads should be directional felled onto these roads with the trees processed and the resulting logging debris placed on the southern side of these roads. To facilitate burning bark should be re-spread, logging debris not windrowed and crowns should be cut and compacted to the ground to reduce elevated fuel loads. Logging debris as far as practicable should be placed greater than one metre from retained trees. All logging debris must be placed on the southern side of these roads to facilitate burning. It is recommended that the processor works in an east to west direction to enable the processor to stay on these roads to minimising disturbance. Disturbance to soil and the understorey on the northern side must be kept to a minimum. Hollow bearing trees within the 3m maintenance zone should remain where they are not deemed as a hazardous tree.

Dust and noise:

- Where residential housing is located adjacent to the compartment boundary or within close proximity to log dumps, the contractor must restrict loud noises (i.e. chainsaw, dozers etc) to between 7:30am and 5:00pm. Operating close to housing during the weekend should be avoided unless prior consultation has occurred.
- Where log haulage routes pass close to rural housing along natural surface/gravel roads (i.e. Clarkes Road) dust and noise must be minimised to the greatest extent practicable. Trucks should reduce speed, restrict use to daylight hours and minimise the use of engine brakes through these areas.

Fence lines

Fences may be located on boundaries that adjoin private freehold of Compartments 2133 and 2135.

- Where harvesting comes within 100m of the fence line the SFO is to inspect the fence line and record the condition of the fence prior to harvesting.
- Any damage caused to these fences as a direct result of harvesting must be paid for by the contractor.

Road closures

- In the event Clarkes and/or Mumbulla Trig and/or Mumbulla Creek Roads are closed. Harvesting Team Leader must notify the relevant National Parks Office regarding the duration and location of the road closure/s. Traffic control signage for "road closures" or "short delays" should be placed in strategic locations to inform the general public of the road closures. Traffic control signage should be placed in such a location that allows large vehicles with trailers etc enough room to turn around safely i.e. entrance to Greendale Road.
- The duration of closure on Clarkes Road, Mumbulla Trig Road and Mumbulla Creek Road must be kept to a minimum to accommodate general public access on these roads.

Outstanding Trees

Compartments 2133 and 2135 has the potential to contain "Outstanding Trees" Trees that are significantly larger than the average stand diameter and height should be considered for retention. The tree/s must be left standing until the SFO or Supervising Forester inspects the tree/s to determine if it is an outstanding tree. The tree is to be retained if determined to be an "Outstanding Tree" and placed on the "Outstanding Tree" data base.

- All trees greater than or equal to 200cm at breast height over bark must be retained.

6: CULTURAL HERITAGE

(a) Cultural Heritage:

All relevant representatives have been consulted and inspected Compartments 2133 and 2135.

7: FLORA AND FAUNA CONDITIONS

7.1: FLORA AND FAUNA GENERAL CONDITIONS.

(a) Tree Retention for Habitat and Food Resources:

Hollow-bearing Trees:

- A minimum of six hollow-bearing live trees per hectare must be retained in “**high**” quality habitat forest, a minimum of four hollow-bearing trees per hectare must be retained in “**moderate**” quality habitat forest and a minimum of two hollow-bearing trees per hectare must be retained in “**low**” quality habitat forest. The determination of “habitat quality classes” will be made by the Supervising Forest Officer (SFO) during tree-marking in the field.
- Where this density is not available, the existing hollow-bearing trees must be retained plus additional trees must be retained to meet the requirement of six per hectare in “high” quality habitat forest, four per hectare in “moderate” quality habitat forest and two per hectare in “low” quality habitat forest. The additional trees retained must be those trees of the next oldest age class available which are likely to persist longer than the oldest trees and are likely to become hollow-bearing trees.
- “Hollow-bearing tree” means a tree where the base, trunk or limbs contain hollows, holes and cavities that have formed as a result of decay, injury or other damage. Such hollows may not be visible from the ground, but may be apparent from the presence of deformities such as burls, protuberances or broken limbs, or where it is apparent the head of the tree has been lost or broken off.
- Retained hollow-bearing trees must represent the range of hollow-bearing species that occur in the area. Preference should be given to selecting those species or trees that are most suitable for the threatened species known or likely to occur in the area.
- Trees retained outside the net logging area must not be counted as hollow-bearing trees. Trees retained within unlogged parts of the net harvest area, that meet the definition of a hollow-bearing tree, should be marked and counted as hollow-bearing trees.
- Hollow-bearing trees must be scattered throughout the net logging area.

Recruitment Trees:

- A minimum of six recruitment trees per hectare must be retained in “**high**” quality habitat forest, a minimum of four recruitment trees per hectare must be retained in “**moderate**” quality habitat forest and a minimum of two recruitment trees per hectare must be retained in “**low**” quality habitat forest.
- Retained recruitment trees must be selected from trees of the next oldest age class available which are likely to persist longer than the oldest trees and are, or are likely to become, hollow-bearing trees.
- Retained recruitment trees must represent the range of tree species that occur in the area. Preference should be given to selecting those species or trees that are most suitable for the threatened species known or likely to occur in the area.
- Trees retained outside the net logging area must not be counted as recruitment trees. Trees retained within unlogged parts of the net logging area, that meet the definition of recruitment tree, should be marked and counted as habitat trees.
- Recruitment trees must be scattered throughout the net logging area.

Dead Stags:

- Five dead stags must be retained per hectare of net logging area where it is safe to do so. If there are less than five stags per hectare, then all stags should be retained where it is safe to do so.
- Stags must not be counted as hollow-bearing trees or recruitment trees.

Significant Food Resources:

- Where more than 30 crushed *Allocasuarina* seed cones have been found beneath an individual of *Allocasuarina* spp., indicating intensive use by the Glossy Black-Cockatoo, the tree must be retained and protected from specified forestry activities.
- Specified forestry activities should be conducted in such a manner as to minimise damage to stands where *Allocasuarina* spp., dominate the canopy.
- All Yellow-bellied Glider and Squirrel Glider sap feed trees must be retained. Yellow-bellied Glider sap feed trees are trees with “V” notch feeding scars. Retained sap feed trees should be counted as hollow-bearing or recruitment trees.
- Damage to flowering or fruiting banksias and *xanthorrhoea* spp should be avoided during forestry operations.

Protection of Hollow-bearing Trees, Recruitment Trees, and Retained Food Trees:

Specified forestry activities and post-logging burning must aim to minimise damage to hollow-bearing trees, recruitment trees, and retained food trees. The potential for damage should be minimised by techniques of directional felling, where it is safe to do so. Logging debris must be removed or flattened where it has accumulated to a height of more than one (1) metre within 5 m of live retained trees, provided it is safe to do so.

(b) Stream Exclusion Zones:

Stream exclusion zones must be applied to the first, second, third, fourth and higher order streams as indicated on the Harvesting Plan Operational Map.

- Where it is considered likely that fire applied externally will enter these exclusion zones through natural spread, a carefully planned ignition pattern and sequence should be applied.
- Existing snig tracks, roads, moisture differentials, ignition patterns and constructed hand trails should be utilised to avoid fire encroachment into this zone.

(c) Ridge and Headwater Habitat:

The head of a Ridge and Headwater Habitat (40m wide x15m long Southern Point GR 759412/5945716) is located north of Dump J on Mumbulla Creek Road within Compartment 2133 as indicated on the Harvesting Plan Operational Map.

- Specified forestry activities must be excluded from this area.
- Existing snig tracks, ignition patterns and constructed hand trails should be utilised to avoid fire encroachment into this zone.

(d) Rainforest areas:

The actual location of rainforest areas as delineated in the Harvesting Plan Operational Maps was determined using API. Field verification will be conducted by the SFO during supervision of the harvesting operation to determine the extent of KB rainforest floristic assemblages.

- Specified forestry activities must be excluded from these rainforest areas and the corresponding 20m exclusion zones.
- Where it is considered likely that fire applied externally will enter this exclusion zone through natural spread, a carefully planned ignition pattern and sequence should be applied. Existing snig tracks, roads, moisture differentials, ignition patterns and constructed hand trails should be utilised to avoid fire encroachment into this zone.

(e) Rare Old Growth Forest Communities:

An area of rare old growth forest community is located on the western section of Coupe 2 of Compartment 2135 as indicated on the Harvesting Plan Operational Map.

- All harvesting activities must be excluded from this area.
- **Where practicable, extraction tracks should be constructed close to the boundaries of the harvested area to act as bare earth breaks around post-harvesting burns. Where this is not practical, the SFO is to assess the need for a bare earth break to be constructed close to harvesting boundaries and, where required the SFO should advise the Operations Forester Eden of this need and estimated works involved. On approval from the Operations Forester Eden the SFO shall engage the contractor to undertake the work concurrent with harvesting, with Forests NSW to be billed appropriately. Where the harvesting configuration does not have suitable machinery to undertake break works, the Operations Supervisor Eden needs to be notified to arrange alternative means of break construction.**
- Where it is considered likely that fire applied externally will enter this exclusion zone through natural spread, a carefully planned ignition pattern and sequence should be applied. Existing snig tracks, roads, moisture differentials, ignition patterns and constructed hand trails should be utilised to avoid fire encroachment into this zone.

(f) **Rare Forest Ecosystems:** Nil.

(g) **Heath and Scrub:** Nil.

(h) Rocky Outcrop and Cliffs:

No rocky outcrops or cliffs were detected during the pre-planning stage. In the event that a rocky outcrop or cliff is located during harvesting then the Threatened Species Licence prescription must be implemented.

(i) **Wetlands:** Nil.

7.2: FLORA AND FAUNA SPECIFIC CONDITIONS.

(a) Rare or Threatened Flora Species:

Chefs Cap Correa:

Chefs Cap Correa (*Correa baeuerlenii*) records are located within Compartments 2133 (GR 758989/5946237 & 759313/5946484) as indicated on the Harvesting Plan Operational Map.

- The SFO is to determine if the above individual records are still present within these compartments. Where Chefs Cap Correa is located its location is to be marked in the field and recorded in the SFO's copy of the harvesting plan.
- Damage to individuals during forestry activities should be avoided to the greatest extent possible.

Forest Red Gum:

Forest Red Gum (*Eucalyptus tereticornis*) individual trees may be located within Compartments 2133 and 2135 particularly on the lower slopes. Where Forest Red Gums are identified during mark-up or harvesting the following prescription must be implemented.

- Forest Red Gum individuals are to be excluded from harvesting. Where the retained Forest Red Gum meet the specifications of a hollow-bearing or recruitment tree then the trees should be counted towards hollow-bearing or recruitment trees.
- Damage to individual trees during forestry activities should be avoided to the greatest extent possible.

(b) Schedule 1 and 2 Fauna Species Prescriptions:

Yellow-bellied Gliders:

Yellow-bellied Glider heard records are located within Coupe 2 of Compartment 2133. Yellow-bellied Glider observed records are located within 100m of Compartment 2135 as indicated on the Harvesting Plan Operational Maps.

The following conditions shall apply for Yellow Bellied Gliders:

- A 50 metre radius exclusion zone must be implemented around Yellow-bellied Glider dens.
- All Yellow-bellied Glider sap feed trees must be retained. All Yellow-bellied Glider sap feed trees must be marked for retention.
- Where there is a record of a Yellow-bellied Glider within the compartment, or within 100m outside the boundary of the compartment, the following must apply:
Within 100m radius (3 ha) around each retained Yellow-bellied Glider sap feed tree, observation or den site record, 15 feed trees must be retained. Yellow-bellied glider sap feed trees must not be counted towards these 15 trees.

- Within a 200m radius of a yellow-bellied Glider call detection site record, 15 trees must be retained.

Mature and late mature trees must be retained as feed trees where these are available. The retained feed trees should be of the same species as the identified sap feed tree, or be a tree species recognised as a sap feed tree in the area (*Eucalyptus botryoides*, *E. cypellocarpa*, *E. viminalis*, *E. ovata*, *E. angophoroides*). The feed trees retained must be marked for retention. Note: habitat trees and recruitment trees may be counted towards the 15 trees as long as they have good crown development, minimal butt damage, should not be suppressed and be of the preferred species (as per above).

Koala:

Compartments 2133 and 2135 were surveyed for koalas in accordance with the Threatened Species Licence for Eden Management Area. No evidence of koalas was located in Compartment 2133 and 2135 during the survey.

- In the event that a koala or evidence of a koala is detected during harvesting the SFO must be notified immediately. Harvesting must cease immediately in the general area of the record and the Harvesting Team Leader notified immediately. Harvesting must not recommence in the general area until further instructions have been received from the Harvesting Team Leader.

Sooty Owl:

Sooty Owl records are located within Compartments 2133 and 2135 as indicated on the Harvesting Plan Operational Maps. Care should be taken during mark up to identify possible roost and nest sites. In the event that a roost or nest tree is located the following shall apply;

- 50m radius exclusion zones are to be placed around Powerful Owl, Masked Owl and Sooty Owl nest sites.
- 30m radius exclusion zones are to be placed around Powerful Owl, Masked Owl and Sooty Owl roost sites.

Gang Gang Cockatoo:

Gang Gang Cockatoo heard records are located within Coupe 1 of Compartments 2133 and 2135 as indicated on the Harvesting Plan Operational Maps.

- Care should be taken during tree-marking to identify, mark and report any Gang Gang Cockatoo nest trees that are found, when a Gang Gang Cockatoo is observed coming out of a hollow.
- All Gang Gang Cockatoo nest trees must be retained.
- A 50 metre radius exclusion zone must be implemented around a Gang Gang Cockatoo nest tree.

Common Bentwing Bat:

A Common Bentwing Bat record is located within the immediate vicinity of these compartments.

The following conditions shall apply for Subterranean Roost Protection:

- An exclusion zone of at least 100m radius must be placed around entrances to all caves, rock overhangs, tunnels and disused mineshafts, with the exception of open pits which are less than three (3) metres in depth, until surveys for the presence of bats have been conducted by FNSW Ecologist.
- Where no bats or evidence of bats have been recorded, the exclusion zone may be reduced to ten metres radius.

- Where bats or evidence of bats have been recorded an exclusion zone of at least 50m radius must be placed around the roost site.
- Where the FNSW Ecologist determines a roost site to be a significant roost site then a 100m radius exclusion zone must be placed around the entrance or entrances of the site

No other Schedule 1 or 2 species that require specific prescription for the proposed operation were detected during pre-harvest surveys or from existing records within the planning unit.

Licensee and supervisory staff must immediately report any sightings of Schedule 1 and 2 species to the Harvesting Team Leader.

8: SOIL EROSION AND WATER POLLUTION CONTROL

Table 3: E.P.L. Site and Soil Assessment Details

Compartments 2133 & 2135			
Inherent Hazard Class	One (1) Thinning Two (2) Integrated	One (1) Thinning Two (2) Integrated	One (1) Thinning Two (2) Integrated
Parent Rock Type	Brogo Granodiorite. Majority of both cpts	Mumbulla Granite Eastern half of Cpt 2135 & strip along the north-eastern edge of Cpt2133	Ordovician Metasediments Strip through the centre of both Cpts & south-eastern corner of Cpt 2133
Dispersible Soils	Nil.	Nil.	Nil.
Mass Movement	Minor	Nil.	Nil.
Seasonality Constraints	Nil.	Nil.	Nil.
Slope limits for Harvesting	See below	See below	See below
Slope limits for Snig Track construction	See below	See below	See below

FNSW internal slope restrictions (i.e. harvesting restricted to slopes $\leq 25^{\circ}$, snig track grade $\leq 20^{\circ}$) applies to those sections of the compartment that are classified as Regolith Class 2. This prescription only applies in those sections where the canopy remove is $>50\%$. Where canopy removal is $\leq 50\%$ then EPL slope restrictions apply.

An area of historic mass movement has been identified above the head of a drainage feature at GR 756844E/5947756N within Compartment 2135 as indicated on the Harvesting Plan Operational Map. The mass movement is approximately 40m X 40m and has now stabilised.

- The area of mass movement is to be excluded from forestry activities including hazard reduction.
- The SFO is to be shown the location of the mass movement. FNSW soil specialist is to conduct a refresher course with the SFO on the features to identify mass movement and where they are likely to occur in the compartment.
- Where it is considered likely that fire applied externally will enter this exclusion zone through natural spread, a carefully planned ignition pattern and sequence should be applied. Existing snig tracks, roads, moisture differentials, ignition patterns and constructed hand trails should be utilised to avoid fire encroachment into this zone

8.1: DRAINAGE FEATURE PROTECTION.

Table 4: Minimum Filterstrip, Stream Exclusion Zones and Drainage Depression Buffer Widths for Drainage Features in Native Forests

Stream Order	Thinning Coupe 1 Cpts 2133 & 2135 Only Drainage Line Filterstrip Width I.H.L. 1 (m)	Integrated Coupe 2 Cpts 2133 & 2135 Drainage Line Filterstrip Width I.H.L. 2 (m)	Stream Exclusion Zones Width (m)	Drainage Depression Buffer Width (m)
Unmapped features	10	10	Nil	5
Mapped 1st Order	10	15	10	5
Mapped 2nd Order	15	20	20	5

- Where filterstrips and stream exclusion zones overlap, the more stringent (widest) condition must apply.

8.2: ROADS AND CROSSINGS.

All new roads and crossings must be constructed in accordance with the location marked in the field and as indicated on the Harvesting Plan Operational Map. Reference must also be made to the Roding Plan in Appendix 1, attached to this harvesting plan.

(a) Wet Weather Controls:

Harvesting operations may be conducted throughout the year subject to the application of normal wet weather closure procedures and restrictions to wet weather areas.

- Dumps C, D, E, F, I, J and K within Compartment 2133 and Dump A within Compartment 2135 are the nominated wet weather dumps for this operation.

(b) Order of working:

For the integrated harvesting operation the order of working will be progressive harvesting in Coupes 2 of Compartments 2133 and 2135, subject to wet weather constraints and as directed by the SFO. The contractor must not leave a designated working area (dump or coupe as specified by the SFO) until approval has been given by the SFO.

For the thinning harvesting operation the order of working will be progressive harvesting in Coupe 1 of Compartments 2133 and 2135.

(c) Downhill Snigging:

Downhill snigging will be required within Coupe 2 of Compartments 2133 and 2135.

Where downhill snig tracks connect directly with a log dump the following must be used:

- Snig tracks must enter the log dump from the side or below; or
- A drainage structure must be in place immediately before a snig track enters the log dump at the end of each days operation.

8.3: LOG DUMPS.**(a) Location:**

Location of log dumps is indicated on the Harvesting Plan Operational Maps.

Log dump size should be kept to a 40mx 40m area where safe to do so. Construction of dumps greater than this area must be approved by the SFO.

8.4: EXTRACTION TRACKS.

Wherever practicable, walkover extraction techniques should be used in preference to snig track construction. Spoil from extraction track construction, upgrading or maintenance must not be placed in watercourses or drainage lines.

The operator, in consultation with the SFO, will determine out-row and forwarder extraction track locations.

9: TREE-MARKING CODE

As required under the terms of the **Threatened Species Licence** and **IFOA**, tree marking in Southern Region - Eden (EMA) must be in accordance with the following state-wide Harvest Marking Code:

Table 5: Harvest Marking Code

Description	Symbol
A. STANDARD MARKINGS/SYMBOLS	
MARKINGS/SYMBOLS THAT DELIVER KEY REQUIREMENTS ON A STATEWIDE BASIS	
Compartment boundary Where not defined by clear features eg. Road, trail, creek	“O” or Yellow tape
Exclusion zone (eg. Old Growth or Species Exclusion Zone) Line not to be crossed or disturbed by fallers or harvesting machinery at any time	Three horizontal lines or rings Or Blue tape
Edge of net harvest area (eg unmerchantable) Retained trees and critical boundaries to be marked within 30m beyond the boundary Tree heads may fall across the line, provided they comply with boundary and tree retention rules (eg 5m debris)	“⊙”
Buffer Zone Areas where disturbance by harvesting is allowed only under specified conditions	Two horizontal lines or rings (with indication of distance if required)
Extraction System Road/Track line	<u>“I” or white tape</u>
Dump site with optional dump number reference	“D” or red tape
Approved crossing site	“β”
Slope angle indication (commences here)	eg “25°”
Trees To Be Removed Individual tree	“•” or dots
Directional felling mark	“←” over “•”
Retained Trees Retained trees not to be removed or damaged (eg grower)	One horizontal line or ring
Habitat tree, for any flora or fauna.	<u>“H”</u>
Eucalypt feed tree	<u>“E”</u>
Recruitment tree	“R”
Cancellation Mark Mark to formally cancel previous marks	“X”

Description	Symbol
Identified Hazard Arrow to indicate direction of hazard	“Ø↑”
SPECIALIST MARKINGS/SYMBOLS Additional specialist Markings/Symbols that may be used in place of, or additional to standard markings to highlight particular issues as required by regulators, Forests NSW, or others.	
Flora Fauna Features Retained Tree Glossy black cockatoo feed tree, record or nest	One horizontal line or ring <i>PLUS</i> “GB”
Owl nest and/or roost	“OWL”
Nest (raptors, parrots etc.)	“N”
Yellow-bellied Glider v-notch feed tree or record	“Y”
Squirrel Glider sap feed tree, record or nest	“SG”
Koala high use tree	“K”
Koala retained feed tree	One horizontal line or ring
Frog record	“F”
Smoky Mouse record	“SM”
Quoll record; latrine; den	“Q”, “QL”, “QD”
Bat record; roost	“B”, “BR”
Phascogale den	“PD”
Threatened plant	“TP”
Other Markings	
Private property	“PP”
Cave, tunnel or mineshaft	“CTM”
Drainage Depression Centre line	“DD”
Coupe Boundary	Blue Ring
Filterstrips/stream exclusion zones	Three horizontal lines or Rings Or Pink tape

Any tree/feature marking will conform to this code. Items to be marked in the field will be specified in the Harvest Plan

10: YIELD ESTIMATES

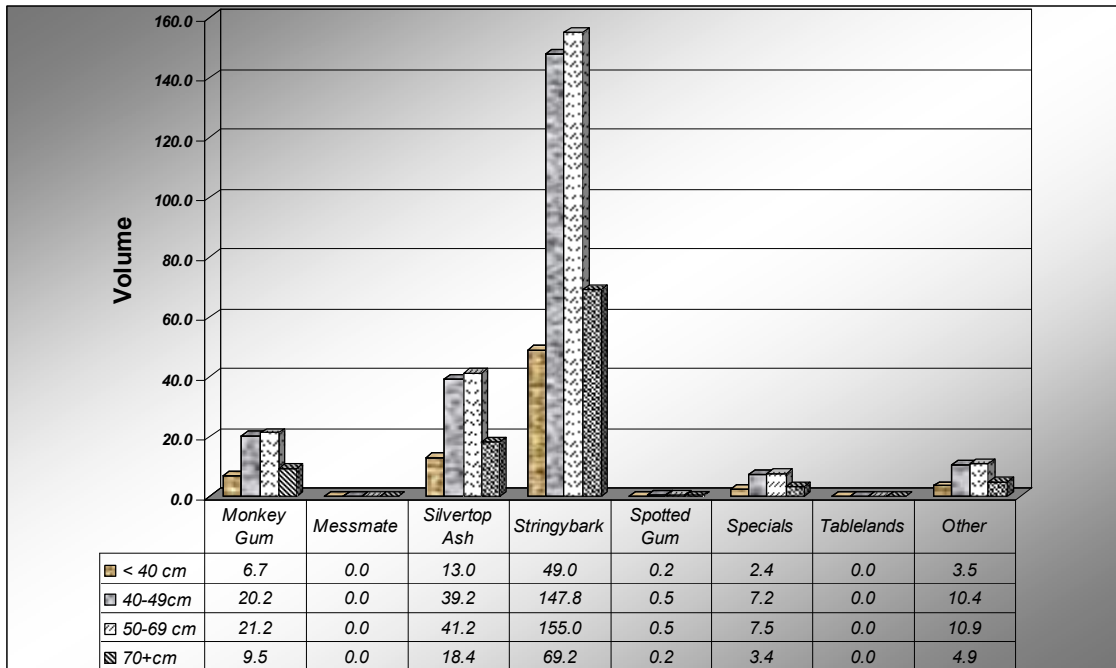
Table 6: Yield Estimate Information

Compartment No.	Sawlog Volume (m ³ /ha)	Pulpwood Volume E1 & E2 (t/ha)	Pulpwood Volume E3 (t / ha)
2133	6	60	12
2135	5	60	10

Source: Eden FRAMES, 1997 and field estimates.

Source: Eden FRAMES, 1997. (Pulpwood volume adjusted to reflect changed specifications 2002).

Graph 1a: Species Group and Size Class Sawlog Volume Predictions Cpt 2133



Note: Predicted volumes have been calculated based on the size and species distribution of the 1:1 harvest. This table provides indicative species and size class information only, it does not account for any local variations between coupes.

Graph 1b: Species Group and Size Class Sawlog Volume Predictions Cpt 2135

There is no volume table information for Compartment 2135

11: AUTHORISATION CONDITIONS

11.1: LEGAL AND ENVIRONMENTAL COMPLIANCE REQUIREMENTS.

This Harvesting Plan is prepared by Forests New South Wales 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.

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:

- all licence conditions issued by Forests NSW under the Forestry Act 1916;
- the “**Forest Practices Code, Part 2, Timber Harvesting in Native Forests - State forests and Crown-timber Lands**” (1999);
- the conditions of “**The Integrated Forestry Operations Approval for the Eden Region, Forestry and National Parks Estate Act 1998**”;
- the schedule of specifications for the harvesting and utilisation of timber applicable to this operation, in this case, the “**Utilisation Schedule for Graded and Salvage Grade (Interim) Sawlogs on Crown Timber Lands within Eden Management Area**” and the “**Wood Supply Agreement**” between State Forests of NSW (now Forests NSW) and Harris Daishowa (Australia) Pty Ltd (trading as “**South East Fibre Exports P/L**”) (29th September 1999)”;
- the Code of Procedure for the measurement of timber and other products applicable to this operation, in this case, the “**Code of Procedure for Sale of Hardwood Sawlogs by Gross Volume Measurement from within Eden Management Area using Truck Delivery Dockets**” and the “**Code of Procedure between Harris Daishowa (Australia) Pty Ltd (trading as “South East Fibre Exports P/L”) and Forestry Commission of NSW (now Forests NSW) for Sale of Native Hardwood Pulpwood by Weight using Truck Delivery Dockets as a Basis for Account within Southern Forestry Region (Edition IV – October 1994)**”; and
- the “**Protocol for Fuel Management - Eden Management Area**”.

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 Forests NSW Licensee.

In preparing this Harvesting Plan, the requirements of Part V of the *Environmental Planning and Assessment Act 1970* (as amended) and Section 92 of the *National Parks and Wildlife Act 1967* have been considered.

11.2: BREACHES AND INFRINGEMENTS.

Non-compliance with any condition or instruction set out in this Harvesting Plan will be dealt with in accordance with Section 6 of the “**Forest Practices Code, Part 2, Timber Harvesting in Native Forests - State forest and Crown-timber Lands**”. Serious breaches may lead to the issue of a Penalty Notice, licensee suspension or prosecution.

11.3: VARIATIONS AND AMENDMENTS TO THIS HARVESTING PLAN.

Conditions and requirements relating to the Environment Protection Licence cannot be varied in the field without the prior approval of the Regional Manager, other than those areas consistent with Condition 16.1 of the Environment Protection Licence. Variations and other specified approvals consistent with Condition 16.1 of the Environment Protection Licence, may be made by the SFO to this Harvesting Plan, subject to the Regional Manager's counter approval. Other approvals may only be made by the Supervising Forester and are also subject to the Regional Manager's counter approval.

All approvals must be recorded on the SFOs' Advise and Comments Form attached to all operational copies of this Harvesting Plan.

This Plan must not be amended by a licensee or contractor.

11.4: HARVESTING PLAN AVAILABILITY.

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

11.5: HARVESTING PLAN DISTRIBUTION LIST.

NAME	PARTS	MINIMUM NO. COPIES
Timber Licensees:	Maps, 1-13 App. 1.	1
	Maps, 1-13 App. 1.	1
Contractors	Maps, 1-13 App. 1.	1
Operator(s) (where required)	Maps, 1-13 App. 1.	
Supervising Forest Officer [SFO(s)]	Maps, 1-13 App. 1.	1
Supervising Forester(s)	Maps, 1-13 App. 1.	1
Regional Office Compartment History File	All	1
Soil Specialist (FNSW)	All	1
Forestry Unit - DECC, Sydney South	Summary of Operations	1 – emailed

11.6: INDUSTRY ENDORSEMENT.

I endorse this Harvesting Plan on behalf of the industry.

At final inspection a S.E.F.E. supervisor must be present. If a S.E.F.E. supervisor is not present, final clearances will not be given.

Company:

Signature:

Licence No :

Date:

Title:

Company:

Signature:

Licence No:

Date:

Title:

12: PRE OPERATION BRIEFING

12.1: HARVESTING CONTRACTOR ACKNOWLEDGEMENT – (SFO COPY).

I acknowledge that I have received a copy of the Harvesting Plan No. HP_ED_2133_2135_10 and that I understand the conditions of the Plan as explained to me by a Supervising Forest Officer. I will brief other operators not present at this briefing prior to them starting operations.

Company: _____ Signature: _____
 Licence No: _____
 Date: _____ Title: _____

12.2: SFO ACKNOWLEDGEMENT – (SFO COPY).

I acknowledge that I have received a copy of the Harvesting Plan No. HP_ED_2133_2135_10 and that I have been briefed on the conditions of the Plan and understand the supervision and operational control requirements as explained to me by the Sales Forester or their delegate.

Acknowledged: _____ Signature: _____
 Title: **Supervising Forest Officer** Date : _____
 Acknowledged: _____ Signature: _____
 Title: **Relief Supervising Forest Officer** Date: _____

12.3: PERSONNEL ATTENDING INSPECTION.

Name	FNSW/LICENCEE	Date
	S.E.F.E	01/03/10
	Contractor Representative	
	Contractor	
	FNSW	
	FNSW	
	FNSW	
	FNSW	

13: CERTIFICATION

PLAN PREPARATION

Prepared by:

Signature:

Title: **Harvest Planning
Team Leader**

Date: **05/03/10.**

EXTERNAL AUTHORITY NOTIFICATION

(To be completed by the person who originally prepared the Plan and who must attach the relevant notifications to the office copy of the Harvesting Plan.)

Notification to DECC.

Name of Authority.	Date of Notification by email.
DECC	16/03/10

REGIONAL APPROVAL

I note notification of this Harvesting Plan to the above-mentioned authority, together with the amendments that have been included in the Final Plan.

This Harvesting Plan comprises pages 1 - 28 attached, the Roding Plan (Appendix 1) and the Harvesting Plan Operational Maps marked and referenced to this Harvesting Plan. This is Harvesting Plan No HP_ED_2133_2135_10.

I approve the issue of this Harvesting Plan subject to any amendments and endorsements that may be made following notification to the Department of Environment and Climate Change.

Approved by:

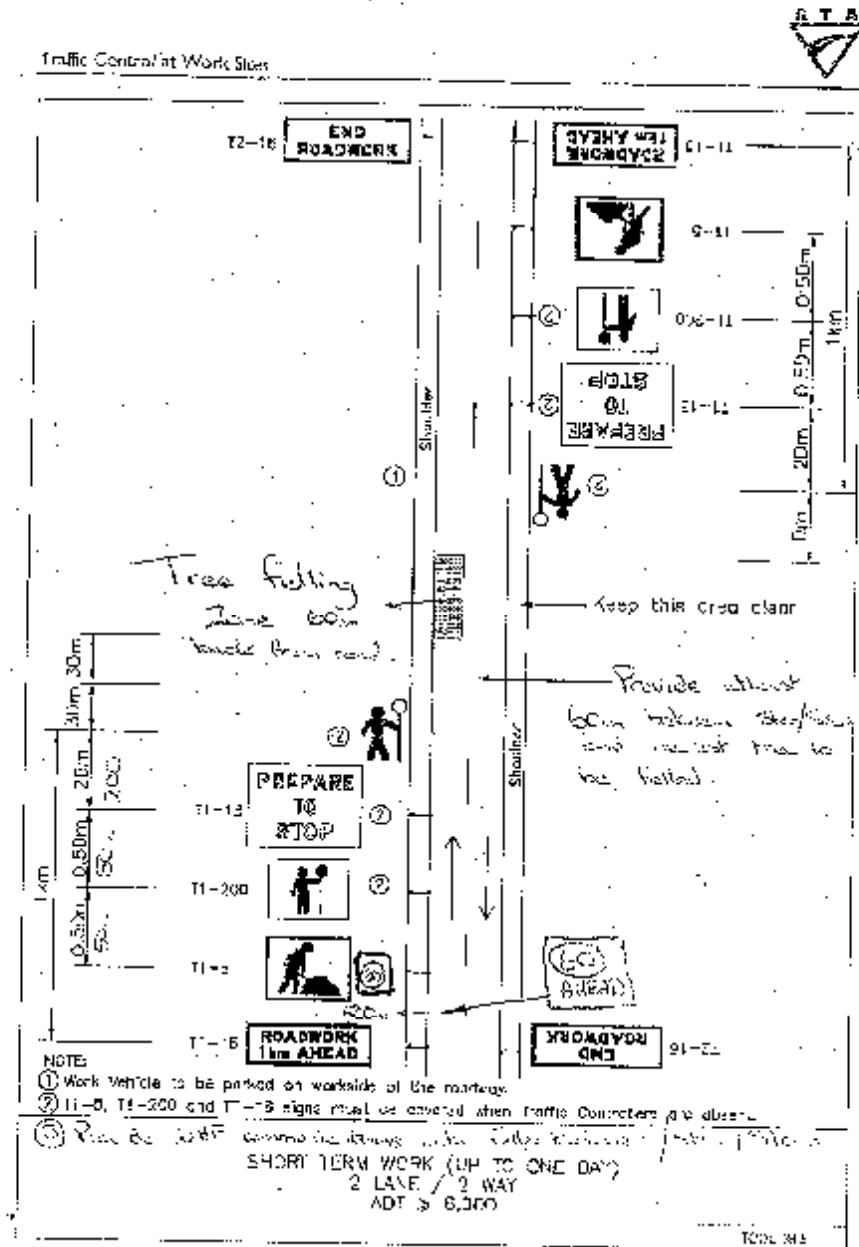
Signature: **Approved**Title: **Regional Manager**

Date:

16/03/10

OPERATION COMMENCEMENT DATE: _____

Appendix 2



TCP 83

September 2003
Issue 1

Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2135/1 & 2

Road Name: Clarkes Rd

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	2260m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	6m	Types of existing road drainage	Relief pipes and mitre drains
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does apply
Max road grade / dist if > 10 degrees	9 degrees	Max. height / length / condition of batters	<4/1200m/Stable
Site specific techniques to lower grade	Not applicable	Condition of existing drop down structures	Not required. Batters stable & >70% vegetation as per EPL.
Maximum ground slope	28 degrees	Site specific techniques for soil erosion & sediment control	See drainage
Feature	Works Required	Final Road Use: Retain	
Pavement	Nil works required	Start Date:	Finish Date:
Roadside Clearing	As required and in accordance with EPL		
Gravelling	Not required		
Drainage	Install relief pipe at GR 756225/5949047 (FNSW). On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains (Contractor).		
Erosion Control	As above		

Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2135/1

Road Name: Mumbulla Trig
Road

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	1360m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	6m	Types of existing road drainage	Relief pipes and mitre drains
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does not comply
Max road grade / dist if > 10 degrees	7 degrees	Max. height / length / condition of batters	<2m/1200m/Stable
Site specific techniques to lower grade	Not applicable	Condition of existing drop down structures	Not required. Batters stable & >70% vegetation as per EPL.
Maximum ground slope (degrees)	18 degrees	Site specific techniques for soil erosion & sediment control	See drainage
Feature	Works Required	Final Road Use: Retain	
Pavement	Nil works required	Start Date:	Finish Date:
Roadside Clearing	As required and in accordance with EPL		
Gravelling	Not required		
Drainage	Install relief pipe at GR 756225/5949047 (FNSW). On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains (Contractor).		
Erosion Control	As above		



Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2135/1

Road Name: 2135-PP Road

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	910m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	4m	Types of existing road drainage	Outfall & infall
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does not comply
Max road grade / dist if > 10 degrees	9 degrees	Max. height / length / condition of batters	<1m/530m/Stable
Site specific techniques to lower grade	Not applicable	Condition of existing drop down structures	Not required as per EPL.
Maximum ground slope (degrees)	15 degrees	Site specific techniques for soil erosion & sediment control	As per drainage
Feature	Works Required	Final Road Use: Retain	
Pavement	Reshape road for full length & where feasible crown road.	Start Date:	Finish Date:
Roadside Clearing	Required for full length. Clearance work must be in accordance with EPL..		
Gravelling	Patch gravel as required		
Drainage	Where road grade <5° install rollovers or mitre drains or where road grade >5° install rubberflaps in accordance with Schedule 5 of the EPL. On completion of use permanent trafficable rollovers to be installed. On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains		
Erosion Control	As above		

Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2135/1

Road Name: 2135-5 Road

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	100m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	4m	Types of existing road drainage	Outfall & infall
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does not comply
Max road grade / dist if > 10 degrees	8 degrees	Max. height / length / condition of batters	<1m\100m\Stable
Site specific techniques to lower grade	Not applicable	Condition of existing drop down structures	Not required as per EPL.
Maximum ground slope (degrees)	13 degrees	Site specific techniques for soil erosion & sediment control	As per drainage
Feature	Works Required - Contractor	Final Road Use: Retain	
Pavement	Reshape road for full length. Where feasible crown road.	Start Date:	Finish Date:
Roadside Clearing	Required for full length. Clearance work must be in accordance with EPL.		
Gravelling	None required.		
Drainage	Where road grade <5° install rollovers or mitre drains or where road grade >5° install rubberflaps in accordance with Schedule 5 of the EPL. On completion of use permanent trafficable rollovers to be installed. On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains		
Erosion Control	As above		

Road Name: 2133-1 Rd

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	770m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	5m	Types of existing road drainage	Outfall & in-fall
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does not comply
Max road grade / dist if > 10 degrees	9 degrees	Max. height / length / condition of batters	<2m\770m\Stable
Site specific techniques to lower grade	Not applicable	Condition of existing drop down structures	Not required as per EPL.
Maximum ground slope (degrees)	22 degrees	Site specific techniques for soil erosion & sediment control	As per drainage
Feature	Works Required - Contractor	Final Road Use: Retain	
Pavement	Reshape road for full length. Where feasible crown road.	Start Date:	Finish Date:
Roadside Clearing	Required for full length. Clearance work must be in accordance with EPL.		
Gravelling	None required.		
Drainage	Where road grade <5° install rollovers or mitre drains or where road grade >5° install rubberflaps in accordance with Schedule 5 of the EPL. On completion of use permanent trafficable rollovers to be installed. On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains		
Erosion Control	As above		

Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2133/1&2

Road Name: Mumbulla Creek Road

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	3440m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	6m	Types of existing road drainage	Relief pipes & mitre drains
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does not comply
Max road grade / dist if > 10 degrees	8 degrees	Max. height / length / condition of batters	<3m\3200m\Stable
Site specific techniques to lower grade	Nil	Condition of existing drop down structures	Not required as per EPL.
Maximum ground slope (degrees)	16 degrees	Site specific techniques for soil erosion & sediment control	As per drainage
Feature	Works Required	Final Road Use: Retain	
Pavement	Nil works required	Start Date:	Finish Date:
Roadside Clearing	As required and in accordance with EPL		
Gravelling	Not required		
Drainage	Check inlets and outlets of existing relief pipes. Clean out where necessary (FNSW). On completion of use permanent trafficable rollovers to be installed. On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains (Contractor)		
Erosion Control	Install relief pipes at GR 760074/5945189, 760169/5944444 & 760081/5944930		

Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2133/1&2

Road Name: Mumbulla Trig
Road

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	2470m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	6m	Types of existing road drainage	Relief pipes & mitre drains
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Yes
Max road grade / dist if > 10 degrees	8 degrees	Max. height / length / condition of batters	<2m\3000m\Stable
Site specific techniques to lower grade	Nil	Condition of existing drop down structures	Not required as per EPL.
Maximum ground slope (degrees)	18 degrees	Site specific techniques for soil erosion & sediment control	As per drainage
Feature	Works Required	Final Road Use: Retain	
Pavement	Nil works required	Start Date:	Finish Date:
Roadside Clearing	As required and in accordance with EPL		
Gravelling	Not required		
Drainage	Check inlets and outlets of existing relief pipes. Clean out where necessary (FNSW). On completion of use permanent trafficable rollovers to be installed. On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains (Contractor).		
Erosion Control	As above		



Appendix 1

Roading Plan - Existing Road

Compartment / Coupe: 2133/1&2

Road Name: Nobby Trail

Road Assessment		Are there any borrow / gravel pits to be used & are they stable?	Nil
Length to be used / reopened / realigned (m)	1430m	Site specific spoil management	As required flatten seed and mulch
Max. pavement width (m)	4m	Types of existing road drainage	Rollovers & mitre drains
Max. clearing outside road prism (m)	3m	Spacing of road drainage comply with EPL?	Currently does not apply
Max road grade / dist if > 10 degrees	10 degrees	Max. height / length / condition of batters	<2m\850m\Stable
Site specific techniques to lower grade	Nil	Condition of existing drop down structures	Not required as per EPL.
Maximum ground slope (degrees)	21 degrees	Site specific techniques for soil erosion & sediment control	As per drainage
Feature	Works Required	Final Road Use: Retain	
Pavement	Nil works required	Start Date:	Finish Date:
Roadside Clearing	Nil works required		
Gravelling	Not required		
Drainage	Where road grade <5° install rollovers or mitre drains or where road grade >5° install rubberflaps in accordance with Schedule 5 of the EPL. On completion of use permanent trafficable rollovers to be installed. On completion of use ensure drainage is in effective working order. Logging debris to be removed from table and mitre drains		
Erosion Control	As above		

Appendix 1

Roothing Plan - Road Construction

Compartment / Coupe: 2135/2

Road Name: 2135-1 & 2 Roads

Features	Road Specifications		Additional instructions / Materials
	2135-1 Rd Specs	2135-2 Rd Specs	
Road Length (m)	370	450	
Max. width of road prism (m)	7	7	
Max. road grade (length road >10m?)	12 degrees (20m)	12 degrees (30m)	
Max. ground slope (length road >30m?)	17 degrees	18	
Max. height of cut / fill batters (m)	<1m	<1m	
Max length of batters (m)	120m	200m	
Type of sediment trapping / soil erosion/ sediment control device to be used during construction	Natural surrounding vegetation supplemented with silt fencing, seed and mulch as required	Natural surrounding vegetation supplemented with silt fencing, seed and mulch as required	
Recommended road drainage type	Recommend rubberflaps if >5 degrees. Rollovers or mitres if < or = 5 degrees. SFO to measure & mark in the field in accordance to Sch. 5 Table 1 of the EPL	Recommend rubberflaps if >5 degrees. Rollovers or mitres if < or = 5 degrees. SFO to measure & mark in the field in accordance to Sch. 5 Table 1 of the EPL	2135-1 Rd estimated 3 rubberflaps 2 Rd estimated 5 rubberflaps
Spacing of road structures to be installed	As per EPL Sch. 5, Section C, Table 1	As per EPL Sch. 5, Section C, Table 1	
Soil erosion / sediment control techniques	Drainage outlets must drain onto stable surface which provides efficient sediment trapping & energy dissipation	Drainage outlets must drain onto stable surface which provides efficient sediment trapping & energy dissipation	
Stabilisation assessment intervals	As per EPL Sch. 5, B5, C15, C17, C19 & C20	As per EPL Sch. 5, B5, C15, C17, C19 & C20	
Drop down & dissipater required	As per EPL Sch.5 H36	As per EPL Sch.5 H36	
Soil stabilisation techniques of disturbed areas	Seed & mulch as required	Seed & mulch as required	
Mass movement / dispersible soils	Nil areas identified within area of road construction as per EPL Sch5 (g)	Nil areas identified within area of road construction as per EPL Sch5 (g)	
Final road use	Retain	Retain	

Appendix 1

Roothing Plan - Road Construction

Compartment / Coupe: 2135/1& 2

Road Name: 2135-3 & 4 Roads

Features	Road Specifications		Additional instructions / Materials
	2135-3 Rd Specs	2135-4 Rd Specs	
Road Length (m)	180	350	
Max. width of road prism (m)	7	7	
Max. road grade (length road >10m?)	12 degrees (20m)	14 degrees (15m)	
Max. ground slope (length road >30m?)	20 degrees	18	
Max. height of cut / fill batters (m)	1m	<1m	
Max length of batters (m)	170	220m	
Type of sediment trapping / soil erosion/ sediment control device to be used during construction	Natural surrounding vegetation supplemented with silt fencing, seed and mulch as required	Natural surrounding vegetation supplemented with silt fencing, seed and mulch as required	
Recommended road drainage type	Recommend rubberflaps if >5 degrees. Rollovers or mitres if < or = 5 degrees. SFO to measure & mark in the field in accordance to Sch. 5 Table 1 of the EPL	Recommend rubberflaps if >5 degrees. Rollovers or mitres if < or = 5 degrees. SFO to measure & mark in the field in accordance to Sch. 5 Table 1 of the EPL	2135-3 Rd estimated 2 rubberflaps estimated 6 rubberflaps 21
Spacing of road structures to be installed	As per EPL Sch. 5, Section C, Table 1	As per EPL Sch. 5, Section C, Table 1	
Soil erosion / sediment control techniques	Drainage outlets must drain onto stable surface which provides efficient sediment trapping & energy dissipation	Drainage outlets must drain onto stable surface which provides efficient sediment trapping & energy dissipation	
Stabilisation assessment intervals	As per EPL Sch. 5, B5, C15, C17, C19 & C20	As per EPL Sch. 5, B5, C15, C17, C19 & C20	
Drop down & dissipater required	As per EPL Sch.5 H36	As per EPL Sch.5 H36	
Soil stabilisation techniques of disturbed areas	Seed & mulch as required	Seed & mulch as required	
Mass movement / dispersible soils	Nil areas identified within area of road construction as per EPL Sch5 (g)	Nil areas identified within area of road construction as per EPL Sch5 (g)	
Final road use	Retain	Retain	

Appendix 1

Roading Plan - Road Construction**Compartment / Coupe: 2135/1 & 2****Road Name: 2135-5 & 6 Roads**

Features	Road Specifications		Additional instructions / Materials
	2135-6 Rd Specs	2135-7 Rd Specs	
Road Length (m)	320	310	
Max. width of road prism (m)	7	7	
Max. road grade (length road >10m?)	13 degrees (30m)	14 degrees (10m)	
Max. ground slope (length road >30m?)	17	10 degrees	
Max. height of cut / fill batters (m)	<1m	Nil	
Max length of batters (m)	200m	Not applicable	
Type of sediment trapping / soil erosion/ sediment control device to be used during construction	Natural surrounding vegetation supplemented with silt fencing, seed and mulch as required	Natural surrounding vegetation supplemented with silt fencing, seed and mulch as required	
Recommended road drainage type	Recommend rubberflaps if >5 degrees. Rollovers or mitres if < or = 5 degrees. SFO to measure & mark in the field in accordance to Sch. 5 Table 1 of the EPL	Recommend rubberflaps if >5 degrees. Rollovers or mitres if < or = 5 degrees. SFO to measure & mark in the field in accordance to Sch. 5 Table 1 of the EPL	2135-6 Rd estimated 6 rubberflaps estimated 2 rubberflaps 21
Spacing of road structures to be installed	As per EPL Sch. 5, Section C, Table 1	As per EPL Sch. 5, Section C, Table 1	
Soil erosion / sediment control techniques	Drainage outlets must drain onto stable surface which provides efficient sediment trapping & energy dissipation	Drainage outlets must drain onto stable surface which provides efficient sediment trapping & energy dissipation	
Stabilisation assessment intervals	As per EPL Sch. 5, B5, C15, C17, C19 & C20	As per EPL Sch. 5, B5, C15, C17, C19 & C20	
Drop down & dissipater required	As per EPL Sch.5 H36	As per EPL Sch.5 H36	
Soil stabilisation techniques of disturbed areas	Seed & mulch as required	Seed & mulch as required	
Mass movement / dispersible soils	Nil areas identified within area of road construction as per EPL Sch5 (g)	Nil areas identified within area of road construction as per EPL Sch5 (g)	
Final road use	Retain	Retain	

FORM 14 (A): ASSESSMENT OF EXISTING DRAINAGE FEATURE CROSSINGS

REGION: Southern Region: Eden.
MANAGEMENT SECTION: Quaama.

STATE FOREST: Mumbulla
COMPARTMENT: 2135

(For factors to be considered under Schedule 2 of the Environment Protection Licence)

Crossing Number	C1	C7
Location	2135-PP Road.	Clarks Road.
GPS co-ordinates	E755869 N5948484	E755660 N5948444.
Drainage Feature	Drainage line.	Drainage line.
Type of drainage crossing structure	Natural Causeway.	750 mm pipe culvert.
Structure stability	Stable.	Stable.
Width of road pavement at crossing	3m.	5m.
Road pavement type & stability	Natural/Stable.	Gravel/Stable.
Road pavement containment	Windrow and vegetation.	Windrow and vegetation.
Approach road grade	+4° Southeast, +8° Northwest.	+7° East, +1° West.
Existing approach drainage structures	South-eastern approach: Crest, North-western approach: Nil.	Both approaches: Mitre Drains.
Distances to approach road drainage structures (w/n 30 m?)	South-eastern approach: 16m. North-western approach: N/A.	Between 7m and 15m.
Stability of outlet discharge	South-eastern vegetated and stable North-western: N/A.	Eastern mitre: Unstable. Western mitre: stable & vegetated.
Bed & bank stability	Vegetated and stable.	Vegetated and stable.
Condition of approach road (w/n 20m)	Stable.	Stable.
*Recommended site specific soil stabilisation techniques w/n 20m of drainage feature crossing	Rock armour the pavement surface within the drainage features and on each approach up to the new rubberflap drains. Note: Flow in the first drainage feature has been diverted down the western approach into a second drainage feature	Eastern approach: Seed and mulch mitre drain located 7m from the crossing. Stabilise with seed and mulch the spoil that has been previously pushed into and around the drainage feature.
*Recommended site specific soil erosion & sediment control techniques	North-western approach: Install rubberflap drain between 5-30m in accordance with the EPL.	Eastern approach: Install sediment fencing at outlet of the mitre drain located 7m from the crossing. Install temporary silt fencing at the ends of any mitres that are discharging directly into the drainage feature.
*Recommended site specific techniques for disposal of excess spoil material	All excess spoil to be placed outside stream exclusion zone as per EPL.	All excess spoil to be placed outside stream exclusion zone as per EPL.
Maintenance instructions / additional recommendations	Where required remove vegetation by hand.	Where required reinstate the windrow on the downstream edge of the road to carry runoff through the crossing. Discharge the runoff through a mitre drain onto a stable surface with sufficient infiltration capacity.

*Also, HP to notify Soil Conservationist & refer to Soil Assessment Report.

FORM 14 (A): ASSESSMENT OF EXISTING DRAINAGE FEATURE CROSSINGS

REGION: Southern Region: Eden.
MANAGEMENT SECTION: Quaama.

STATE FOREST: Mumbulla
COMPARTMENT: 2135

(For factors to be considered under Schedule 2 of the Environment Protection Licence)

Crossing Number	C8	C9
Location	Clarks Road	Clarks Road.
GPS co-ordinates	E755756 N5948708.	E755886 N5948930.
Drainage Feature	Drainage line.	Drainage line.
Type of drainage crossing structure	750 mm pipe culvert.	750 mm pipe culvert.
Structure stability	Stable.	Stable.
Width of road pavement at crossing	4m.	6m.
Road pavement type & stability	Gravel/Stable.	Gravel/Stable.
Road pavement containment	Windrow and vegetation.	Windrow and vegetation.
Approach road grade	-5° East, +7° West.	+8° East, -7° South-western.
Existing approach drainage structures	Both approaches: Mitre Drains.	Both approaches: Mitre Drains.
Distances to approach road drainage structures (w/n 30 m?)	Between 5 and 20m.	Between 14m and 20m.
Stability of outlet discharge	Eastern mitre: Stable & vegetated. Western mitre: Unstable.	Eastern mitre: Unstable. Western mitre: Stable & vegetated.
Bed & bank stability	Vegetated and stable.	Vegetated and stable.
Condition of approach road (w/n 20m)	Stable.	Stable.
*Recommended site specific soil stabilisation techniques w/n 20m of drainage feature crossing	Western approach: Seed and mulch mitre drain located on cut side of road 20m from the crossing. Stabilise with seed and mulch the spoil that has been previously pushed into and around the drainage feature.	Eastern approach: Seed and mulch both mitre drains located 14m from the crossing. Stabilise with seed and mulch the spoil that has been previously pushed into and around the drainage feature.
*Recommended site specific soil erosion & sediment control techniques	Western approach: Install sediment fencing at outlet of the mitre drain located on cut side of road 20m from the crossing. Install temporary silt fencing at the ends of any mitres that are discharging directly into the drainage feature.	Eastern approach: Install sediment fencing at outlet of the mitre drain located 14m from the crossing. Install temporary silt fencing at the ends of any mitres that are discharging directly into the drainage feature.
*Recommended site specific techniques for disposal of excess spoil material	All excess spoil to be placed outside stream exclusion zone as per EPL.	All excess spoil to be placed outside stream exclusion zone as per EPL.
Maintenance instructions / additional recommendations	Clean out outlet of drainage structure. Where required reinstate the windrow on the downstream edge of the road to carry runoff through the crossing. Discharge the runoff through a mitre drain onto a stable surface with sufficient infiltration capacity.	Where required reinstate the windrow on the downstream edge of the road to carry runoff through the crossing. Discharge the runoff through a mitre drain onto a stable surface with sufficient infiltration capacity.

*Also, HP to notify Soil Conservationist & refer to Soil Assessment Report.

FORM 14 (A): ASSESSMENT OF EXISTING DRAINAGE FEATURE CROSSINGS

REGION: Southern Region: Eden.
MANAGEMENT SECTION: Quaama.

STATE FOREST: Mumbulla
COMPARTMENT: 2135

(For factors to be considered under Schedule 2 of the Environment Protection Licence)

Crossing Number	C10	C11
Location	Clarks Road.	Clarks Road.
GPS co-ordinates	E755946 N5949047.	E756028 N5949142.
Drainage Feature	Drainage line.	Drainage line.
Type of drainage crossing structure	600 mm pipe culvert.	600 mm pipe culvert.
Structure stability	Stable.	Stable.
Width of road pavement at crossing	4m.	5m.
Road pavement type & stability	Gravel/Stable.	Gravel/Stable.
Road pavement containment	Windrow and vegetation.	Windrow and vegetation.
Approach road grade	- 4° South-east, +4° North-west.	+7° South-east, -7° Western.
Existing approach drainage structures	Both approaches: Mitre Drains.	Both approaches: Mitre Drains.
Distances to approach road drainage structures (w/n 30 m?)	Between 6m and 23m.	Between 5m and 15m.
Stability of outlet discharge	South-eastern mitre: Stable & vegetated. North-Western mitre: Unstable.	Unstable.
Bed & bank stability	Vegetated and stable.	Vegetated and stable.
Condition of approach road (w/n 20m)	Stable.	Stable.
*Recommended site specific soil stabilisation techniques w/n 20m of drainage feature crossing	North-western approach: Seed and mulch mitre drain located on cut side of road 6m from the crossing. Stabilise with seed and mulch the spoil that has been previously pushed into and around the drainage feature.	Seed and mulch mitre drains located within 30m of the crossing. Stabilise with seed and mulch the spoil that has been previously pushed into and around the drainage feature.
*Recommended site specific soil erosion & sediment control techniques	Install temporary silt fencing at the ends of any mitres that are discharging directly into the drainage feature.	Install temporary silt fencing at the ends of any mitres that are discharging directly into the drainage feature.
*Recommended site specific techniques for disposal of excess spoil material	All excess spoil to be placed outside stream exclusion zone as per EPL.	All excess spoil to be placed outside stream exclusion zone as per EPL.
Maintenance instructions / additional recommendations	Clean out inlet and outlet of drainage structure. Where required reinstate the windrow on the downstream edge of the road to carry runoff through the crossing. Discharge the runoff through a mitre drain onto a stable surface with sufficient infiltration capacity.	Where required reinstate the windrow on the downstream edge of the road to carry runoff through the crossing. Discharge the runoff through a mitre drain onto a stable surface with sufficient infiltration capacity.

*Also, HP to notify Soil Conservationist & refer to Soil Assessment Report.

FORM 14 (A): ASSESSMENT OF EXISTING DRAINAGE FEATURE CROSSINGS

REGION: Southern Region: Eden.
MANAGEMENT SECTION: Quaama.

STATE FOREST: Mumbulla
COMPARTMENT: 2135

(For factors to be considered under Schedule 2 of the Environment Protection Licence)

Crossing Number	C12
Location	Clarks Road.
GPS co-ordinates	E756461 N5949062.
Drainage Feature	Drainage line.
Type of drainage crossing structure	850 mm pipe culvert.
Structure stability	Stable.
Width of road pavement at crossing	5m.
Road pavement type & stability	Gravel/Stable.
Road pavement containment	Windrow and vegetation.
Approach road grade	+5° South-east, -5° Western.
Existing approach drainage structures	South-eastern approach: Mitre Drains, Western approach: Outfall.
Distances to approach road drainage structures (w/n 30 m?)	South-eastern approach: 8m. Western approach: Outfall.
Stability of outlet discharge	Stable & vegetated.
Bed & bank stability	Vegetated and stable.
Condition of approach road (w/n 20m)	Stable.
*Recommended site specific soil stabilisation techniques w/n 20m of drainage feature crossing	Stabilise with seed and mulch the spoil that has been previously pushed into and around the drainage feature.
*Recommended site specific soil erosion & sediment control techniques	Western approach: Install mitre drains within 5-30m of crossing in accordance with EPL.
*Recommended site specific techniques for disposal of excess spoil material	All excess spoil to be placed outside stream exclusion zone as per EPL.
Maintenance instructions / additional recommendations	Reinstate the windrow on the downstream edge of the road to carry runoff through the crossing. Discharge the runoff through a mitre drain onto a stable surface with sufficient infiltration capacity.

*Also, HP to notify Soil Conservationist & refer to Soil Assessment Report.

FORM 14 (A): ASSESSMENT OF EXISTING DRAINAGE FEATURE CROSSINGS

REGION: Southern Region: Eden.
MANAGEMENT SECTION: Quaama.

STATE FOREST: Mumbulla
COMPARTMENT: 2133

(For factors to be considered under Schedule 2 of the Environment Protection Licence)

Crossing Number	C1
Location	Mumbulla Creek Road.
GPS co-ordinates	E759536 N5946284.
Drainage Feature	Drainage line.
Type of drainage crossing structure	Log Bridge.
Structure stability	Stable.
Width of road pavement at crossing	5m.
Road pavement type & stability	Gravel/Stable.
Road pavement containment	Kerb Logs and vegetation.
Approach road grade	+4° Northern, +3° Southern.
Existing approach drainage structures	Mitre Drains on both approaches.
Distances to approach road drainage structures (w/n 30 m?)	Between 15m and 20m.
Stability of outlet discharge	Vegetated and stable.
Bed & bank stability	Vegetated and stable.
Condition of approach road (w/n 20m)	Stable.
*Recommended site specific soil stabilisation techniques w/n 20m of drainage feature crossing	None required.
*Recommended site specific soil erosion & sediment control techniques	SFO to monitor effectiveness of mitre drains and crowning. If drainage becomes ineffective during haulage install rubberflap drains between 5m and 30m from the drainage feature as per the EPL.
*Recommended site specific techniques for disposal of excess spoil material	Not applicable.
Maintenance instructions / additional recommendations	Kerb log on lower side has a hole developing. Insert material so sediment does not go into feature or replace if necessary.

*Also, HP to notify Soil Conservationist & refer to Soil Assessment Report.

FORM 14(B): PROPOSED DRAINAGE FEATURE CROSSINGS

REGION: Southern Region – Eden.
 MANAGEMENT SECTION: Quaama
 WORKS RESPONSIBILITY: Forests NSW / Harvesting Contractor.

STATE FOREST: Mumbulla No. 605.
 COMPARTMENT: 2135.

Crossing Number	C2	Works completed
Location / GPS co-ordinates	New access 2135-4 Road. GR: E756621 N5948603.	
Drainage feature / Permanence of flow	Drainage depression / Ephemeral.	
Proposed crossing structure	Natural causeway with rock apron.	Yes / No
Width and length of crossing	10m x 4m.	
Additional clearing width upstream and downstream	Maximum of 3.0 m.	
Nature and extent of reshaping of stream bed and banks required	No stream banks. Minimise the amount of cut through the drainage depression. Clearing of understorey vegetation on road prism only.	Yes / No
Recommended site specific techniques to:		
- Prevent spoil entering drainage feature during works.	Minimise earthworks and disturbance to the bed of the drainage depression. Reverse machinery into the drainage feature and push out from the centre of the drainage feature back to the approaches. Seed and mulch disturbed areas within 30m of the crossing.	Yes / No
- Dispose of excess spoil material	All excess spoil to be deposited outside the stream exclusion zone.	Yes / No
- Stabilise outlet discharge areas	Minimise disturbance to existing vegetated surface of bed immediately below crossing. Disturbed areas to be seeded and mulched.	
- Contain road pavement fill	Rock retaining wall. The rock must be of suitable size to withhold the rock armouring during haulage.	Yes / No
- Prevent run-off from crossing pavement entering drainage feature during road use	Rock armour pavement through crossing.	Yes / No
- Stabilise soil within 20 m of the drainage feature crossing	Stables running surface through the drainage depression with rock if required. Seed and mulch disturbed areas.	Yes / No
Approaches:		
- Approach road grade	+8° North-western approach and +1° South-eastern approach.	
- Type of road drainage structure required b/n 5 – 30 m	North-western approach only: Rubberflap drain to be installed between 5 – 30 m from the apparent centre of the drainage feature. Permanent trafficable rollover to be install upon completion of use.	Yes / No
- Drainage structure outlet control method	Ensure that approach drainage structures drain onto stable, vegetated surface.	Yes / No
- Silt control in table and mitre drain	Ensure that outlet discharges onto stable, vegetated surface.	
Recommended techniques to prevent water pollution if approach cannot be drained within 5 – 30 m	Not applicable.	
Date commenced:	Not applicable.	
Date completed:		
Soil Stabilisation within 5 days (Y/N)		

FORM 14(B): PROPOSED DRAINAGE FEATURE CROSSINGS

REGION: Southern Region – Eden.
 MANAGEMENT SECTION: Quaama
 WORKS RESPONSIBILITY: Forests NSW / Harvesting Contractor.

STATE FOREST: Mumbulla No. 605.
 COMPARTMENT: 2135.

Crossing Number	C3	Works completed
Location / GPS co-ordinates	New access 2135-4 Road. GR: E756623 N5948484.	
Drainage feature / Permanence of flow	Drainage depression / Ephemeral.	
Proposed crossing structure	Natural Causeway with rock apron.	Yes / No
Width and length of crossing	10m x 4m.	
Additional clearing width upstream and downstream	Maximum of 3.0 m.	
Nature and extent of reshaping of stream bed and banks required	No stream banks. Minimise the amount of cut through the drainage depression. Clearing of understorey vegetation on road prism only.	Yes / No
Recommended site specific techniques to:		
- Prevent spoil entering drainage feature during works.	Construct the crossing close to the natural surface (i.e. minimal sidecut). Reverse machinery into the drainage feature and push out from the centre of the drainage feature back to the approaches. Seed and mulch disturbed areas within 30m of the crossing.	Yes / No
- Dispose of excess spoil material	All excess spoil to be deposited outside the stream exclusion zone.	Yes / No
- Stabilise outlet discharge areas	Minimise disturbance to existing vegetated surface of bed immediately below crossing. Disturbed areas to be seeded and mulched.	
- Contain road pavement fill	Rock retaining wall. The rock must be of suitable size to withhold the rock armouring during haulage.	Yes / No
- Prevent run-off from crossing pavement entering drainage feature during road use	Rock armour pavement through crossing.	Yes / No
- Stabilise soil within 20 m of the drainage feature crossing	Stables running surface through the drainage depression with rock if required. Seed and mulch disturbed areas.	Yes / No
Approaches:		
- Approach road grade	+3° Western approach and +13° North-eastern approach.	
- Type of road drainage structure required b/n 5 – 30 m	On both approaches: Rubberflap drains to be installed between 5 – 30 m from the apparent centre of the drainage feature. Permanent trafficable rollover to be installed upon completion of use.	Yes / No
- Drainage structure outlet control method	Ensure that approach drainage structures drain onto stable, vegetated surface.	Yes / No
- Silt control in table and mitre drain	Ensure that outlet discharges onto stable, vegetated surface.	
Recommended techniques to prevent water pollution if approach cannot be drained within 5 – 30 m	Not applicable.	
Date commenced:	Not applicable.	
Date completed:		
Soil Stabilisation within 5 days (Y/N)		

FORM 14(B): PROPOSED DRAINAGE FEATURE CROSSINGS

REGION: Southern Region – Eden.
 MANAGEMENT SECTION: Quaama
 WORKS RESPONSIBILITY: Forests NSW / Harvesting Contractor.

STATE FOREST: Mumbulla No. 605.
 COMPARTMENT: 2135.

Crossing Number	C4	Works completed
Location / GPS co-ordinates	New access 2135-5 Road GR E756765 N5947603.	
Drainage feature / Permanence of flow	Drainage line. / Ephemeral.	
Proposed crossing structure	Log bridge with geotextile and kerb logs. (To comply with EPL minimum span / length 10m, minimum depth 1.6m preferred depth 1.8m).	Yes / No
Width and length of crossing	5m long x 4.0 m wide. Requires 10-11m stringers.	
Additional clearing width upstream and downstream	Maximum of 3m either side of crossing.	
Nature and extent of reshaping of stream bed and banks required	Minor reshaping of both approaches required.	Yes / No
Recommended site specific techniques to:		
- Prevent spoil entering drainage feature during works.	Excavation for bed logs to be carried out by suitable machinery to minimise loose spoil. All spoil to be removed immediately and disturbed areas levelled, seeded and mulched. Sediment fencing to be erected if required.	Yes / No
- Dispose of excess spoil material	All excess spoil to be deposited outside the filterstrip/stream exclusion zone. Ensure all road drainage is diverted away from the stockpile area.	Yes / No
- Stabilise outlet discharge areas	Minimise disturbance to existing vegetated surface of bed. Disturbed areas to be levelled, seeded and mulched.	
- Contain road pavement fill	Sufficient geotextile must be placed over the bridge stringers and kerb logs to contain all pavement fill. Kerb logs of sufficient diameter to contain all pavement fill must be installed on both the upstream and downstream side of the bridge. Wing logs to be installed if required.	Yes / No
- Prevent run-off from crossing pavement entering drainage feature during road use	Install sediment dams where required. Location of sediment dams to be decided during crossing construction. Construct bridge to ensure flow from bridge drain into the sediment dams. Notched outlet to be cut into uppermost log of dam. Geotextile to be anchored to logs.	Yes / No
- Stabilise soil within 20 m of the drainage feature crossing	All disturbed areas to be levelled, seeded and mulched.	Yes / No
Approaches:		
- Approach road grade	+16° West, +17° East.	
- Type of road drainage structure required b/n 5 – 30 m	Both approaches: Install rubberflap drains at 5 – 30 m from the crossing in accordance with the EPL. Permanent trafficable rollovers to be constructed on completion of operations.	Yes / No
- Drainage structure outlet control method	Outlet to discharge into undisturbed vegetation and /or sediment dam.	Yes / No
- Silt control in table and mitre drain	As per the EPL.	
Recommended techniques to prevent water pollution if approach cannot be drained within 5 – 30 m	Not applicable.	
Date commenced:		
Date completed:		

FORM 14(B): PROPOSED DRAINAGE FEATURE CROSSINGS

REGION: Southern Region – Eden.
 MANAGEMENT SECTION: Quaama
 WORKS RESPONSIBILITY: Forests NSW / Harvesting Contractor.

STATE FOREST: Mumbulla No. 605.
 COMPARTMENT: 2135.

Crossing Number	C5	Works completed
Location / GPS co-ordinates	New access 2135-5 Road. GR: E756720 N5947643.	
Drainage feature / Permanence of flow	Drainage line / Ephemeral.	
Proposed crossing structure	Natural Causeway with rock apron.	Yes / No
Width and length of crossing	5m x 4m.	
Additional clearing width upstream and downstream	Maximum of 3.0 m.	
Nature and extent of reshaping of stream bed and banks required	Minimise the amount of cut through the drainage line. Clearing of understorey vegetation on road prism only.	Yes / No
Recommended site specific techniques to:		
- Prevent spoil entering drainage feature during works.	Minimise earthworks and disturbance to the banks and bed of the drainage line. Reverse machinery into the drainage feature and push out from the centre of the drainage feature back to the approaches. Seed and mulch disturbed areas within 30m of the crossing.	Yes / No
- Dispose of excess spoil material	All excess spoil to be deposited outside the stream exclusion zone.	Yes / No
- Stabilise outlet discharge areas	Minimise disturbance to existing vegetated surface of bed immediately below crossing. Disturbed areas to be seeded and mulched.	
- Contain road pavement fill	Rock retaining wall. The rock must be of suitable size to withhold the rock armouring during haulage.	Yes / No
- Prevent run-off from crossing pavement entering drainage feature during road use	Rock armour pavement through crossing.	Yes / No
- Stabilise soil within 20 m of the drainage feature crossing	Seed and mulch disturbed areas.	Yes / No
Approaches:		
- Approach road grade	+9° Eastern approach and +9° Western approach.	
- Type of road drainage structure required b/n 5 – 30 m	On both approaches: Rubberflap drains to be installed between 5 – 30 m from the drainage feature in accordance with the EPL. Permanent trafficable rollover to be installed upon completion of use.	Yes / No
- Drainage structure outlet control method	Ensure that approach drainage structures drain onto stable, vegetated surface.	Yes / No
- Silt control in table and mitre drain	Ensure that outlet discharges onto stable, vegetated surface.	
Recommended techniques to prevent water pollution if approach cannot be drained within 5 – 30 m	Not applicable.	
Date commenced:	Not applicable.	
Date completed:		
Soil Stabilisation within 5 days (Y/N)		

FORM 14(B): PROPOSED DRAINAGE FEATURE CROSSINGS

REGION: Southern Region – Eden.

STATE FOREST: Mumbulla No. 605.

MANAGEMENT SECTION: Quaama

COMPARTMENT: 2135.

WORKS RESPONSIBILITY: Forests NSW / Harvesting Contractor.

Crossing Number	C6	Works completed
Location / GPS co-ordinates	Existing section of 2135-PP ext Road GR E756547 N5947654.	
Drainage feature / Permanence of flow	Drainage line. / Ephemeral.	
Proposed crossing structure	Log bridge with geotextile and kerb logs. (To comply with EPL minimum span / length 10m, minimum depth 1.6m preferred depth 1.8m).	Yes / No
Width and length of crossing	6m long x 4.0 m wide. Requires 11-12m stringers.	
Additional clearing width upstream and downstream	Maximum of 3m either side of crossing.	
Nature and extent of reshaping of stream bed and banks required	Minor reshaping of both approaches required.	Yes / No
Recommended site specific techniques to:		
- Prevent spoil entering drainage feature during works.	Excavation for bed logs to be carried out by suitable machinery to minimise loose spoil. All spoil to be removed immediately and disturbed areas levelled, seeded and mulched. Sediment fencing to be erected if required.	Yes / No
- Dispose of excess spoil material	All excess spoil to be deposited outside the filterstrip/stream exclusion zone. Ensure all road drainage is diverted away from the stockpile area.	Yes / No
- Stabilise outlet discharge areas	Minimise disturbance to existing vegetated surface of bed. Disturbed areas to be levelled, seeded and mulched.	
- Contain road pavement fill	Sufficient geotextile must be placed over the bridge stringers and kerb logs to contain all pavement fill. Kerb logs of sufficient diameter to contain all pavement fill and must be installed on both the upstream and downstream side of the bridge. Wing logs to be installed if required.	Yes / No
- Prevent run-off from crossing pavement entering drainage feature during road use	Install sediment dams where required. Location of sediment dams to be decided during crossing construction. Construct bridge to ensure flow from bridge drain into the sediment dams. Notched outlet to be cut into uppermost log of dam. Geotextile to be anchored to logs.	Yes / No
- Stabilise soil within 20 m of the drainage feature crossing	All disturbed areas to be levelled, seeded and mulched.	Yes / No
Approaches:		
- Approach road grade	+15° West, +18° East.	
- Type of road drainage structure required b/n 5 – 30 m	Both approaches: Install rubberflap drains at 5 – 30 m from the crossing in accordance with the EPL. Permanent trafficable rollovers to be constructed on completion of operations.	Yes / No
- Drainage structure outlet control method	Outlet to discharge into undisturbed vegetation and /or sediment dam.	Yes / No
- Silt control in table and mitre drain	As per the EPL	
Recommended techniques to prevent water pollution if approach cannot be drained within 5 – 30 m	Not applicable.	
Date commenced:		
Date completed:		