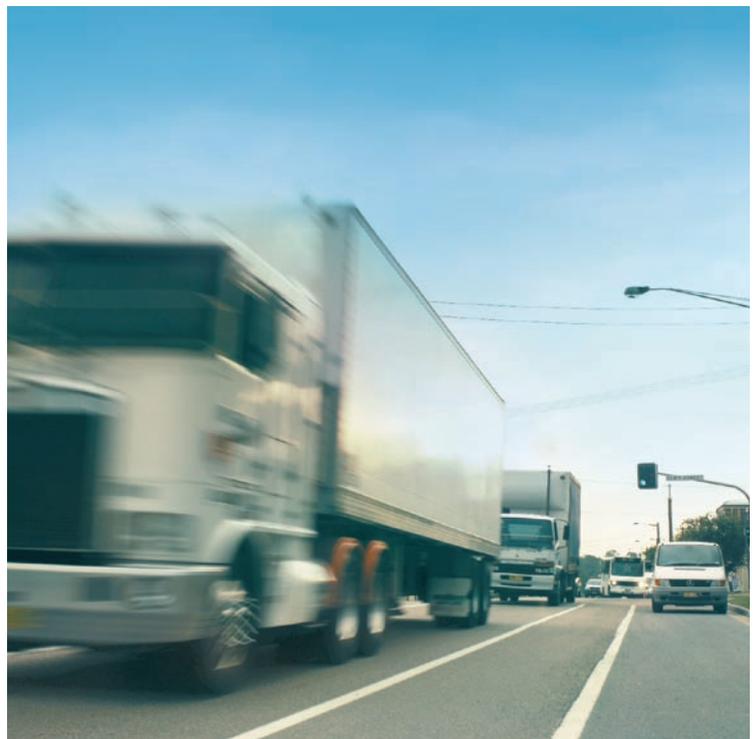




F3 Freeway to Branxton link

Design Changes to the Approved Project Environmental Assessment

MARCH 2007



**AusLink National Network
F3 to Branxton link**

**Design Changes to the Approved Project
Environmental Assessment**



Roads and Traffic Authority of NSW

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Document information

File name	Status	Issued To	Issue Date
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Certification

This environmental assessment report provides a true and fair review of the proposed design changes to the F3 to Branxton link.

Acacia Environmental Planning certifies that at the time of accepting the contract for preparation of this report, it had no contractual interest in the construction and/or operation of the F3 to Branxton link.

Signed: 

Norman Shapro

Director, Acacia Environmental Planning Pty Ltd

Date: 28 February 2007

I have examined this environmental assessment report and the certification by Acacia Environmental Planning and accept the environmental assessment report on behalf of the RTA.

Name Allan Bowditch
Designation Project Development Manager
Infrastructure Development

Signed 

Date 28 February 2007

References used in this report

References to previous organisations or titles in this report also mean their successor and current organisations or titles, as the case requires.

Reference in this report	Current organisation or title
<ul style="list-style-type: none">Minister for Urban Affairs and PlanningMinister for Infrastructure and Planning	Minister for Planning
<ul style="list-style-type: none">Department of Urban Affairs and PlanningPlanningNSWDepartment of Infrastructure, Planning and Natural Resources	Department of Planning
<ul style="list-style-type: none">Director-General of the Department of Urban Affairs and PlanningDirector-General of PlanningNSWDirector-General of the Department of Infrastructure, Planning and Natural Resources	Director-General of the Department of Planning
<ul style="list-style-type: none">Director-General of National Parks and Wildlife	Director-General of the Department of Environment and Conservation
<ul style="list-style-type: none">Australian Government Department of the Environment and Heritage	Department of the Environment and Water Resources

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Acacia Environmental Planning acknowledges the assistance of Messrs Allan Bowditch, Phil Davies, David Ledlin, Stuart Hill and Phil Vine of the RTA, and Dr Rhidian Harrington and Messrs Robert Suansri and Nathan Smith of Biosis Research in preparing this report.

Further changes may be proposed

Some aspects of the detailed concept design may change following the public display of the F3 to Branxton link and/or the results of additional engineering and environmental investigations now being undertaken. The community will be informed of additional changes that may be proposed by the RTA.

Summary

Background

On behalf of the Australian and NSW governments, the Roads and Traffic Authority of NSW (RTA) proposes to construct a highway link between the F3 Freeway and Branxton (the F3 to Branxton link or the Link). The F3 to Branxton link was granted concurrence by the Director-General of National Parks and Wildlife and approval by the Minister for Planning in 2001. On 1 August 2005, the Minister's approval became a project approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (the Approved Project).

Review of the concept design

The RTA has undertaken an extensive review of the concept design (see the Glossary for definitions), on which the Minister's approval is based. The review identified ways to reduce impacts and identified the extent and impact of ancillary infrastructure needed to construct the Approved Project. The RTA proposes to make 15 design changes to the Approved Project. Overall, they would reduce impacts on flora and fauna, as well as improve other traffic network, engineering and environmental outcomes.

The proposed modification

The RTA has determined that three of the 15 proposed design changes, the location of some water quality controls and boundary fencing, and the total area of native vegetation that would be cleared would be inconsistent with the Minister's approval. The remaining 12 of the 15 proposed design changes would be consistent with the Minister's approval::

- Alterations to the functional design of the F3, Buchanan, Loxford and Allandale interchanges.
- Slight changes to the location of the Averys Lane and McLeod Road overpasses and the Camp Road underpass to allow construction under traffic.
- The realignment of the Approved Project at Surveyors Creek and Sawyers Gully to reduce clearing of native vegetation.
- The change to the bridge over Swamp Creek to accommodate the change to the crossing of the South Maitland Railway and the F3 to Branxton link.

Findings

The environmental assessment in this report focuses on new or changed impacts from the 12 proposed design changes that the existing Conditions of Approval or Conditions of Concurrence may or could not have anticipated.

- The proposed design changes would have similar environmental impacts on soil and water quality, acid sulphate soils, aquatic flora and fauna, air quality, context sensitive design and landscaping, risks and hazards, waste management, contractor work sites, and cumulative effects as those of the Approved Project. The existing environmental requirements in the Conditions of Approval and Conditions of Concurrence would be adequate to manage or minimise these impacts.
- The proposed design changes would reduce clearing of native vegetation and improve ecological outcomes. Overall, the detailed concept design, which includes the 12 proposed design changes, would reduce total native vegetation clearing by 11 ha to 157 ha. The recognition of road-related ancillary infrastructure would increase clearing of native vegetation from 157 ha to 182 ha.
- The proposed design change at the Newcastle interchange would avoid impacts on Aboriginal and European heritage sites.
- Some of the proposed design changes would change the location of road traffic noise sources. An updated noise impact assessment (Atkins Acoustics and Associates Pty Ltd 2007) identified noise controls that would be needed to satisfy relevant road traffic noise criteria.
- The Surveyors Creek realignment would require land acquisition from two properties that were not previously affected by the Approved Project, and avoid the need to acquire part of one property. The proposed design changes at the McLeod Road overpass and the Sawyers Gully realignment would slightly alter the extent of land acquisition on properties that were previously affected by the Approved Project. The RTA would acquire all land needed for the proposed design changes in accordance with the RTA's *Land Acquisition Policy* (see Appendix 5) with compensation determined under the *Land Acquisition (Just Terms Compensation) Act 1991*.
- The proposed design changes at the Newcastle and Buchanan interchanges would improve traffic flow and therefore reduce travel time and delays.

- Due to the impact on flora species listed under the EPBC Act¹, the RTA would refer the proposed design changes to the Australian Government Department of the Environment and Heritage for approval as a controlled action.

Environmental safeguards

The Conditions of Approval and Concurrence that apply to the Approved Project would apply to the proposed design changes. They are comprehensive and would be adequate to manage the change in the location, magnitude and extent of potential adverse environmental impacts that could be caused by constructing and operating the F3 to Branxton link, as modified. For these reasons, the RTA does not propose additional commitments to safeguard the environment.

Legislative requirements and approvals

The RTA would require an Environment Protection Licence under the *Protection of the Environment Operations Act 1997* to construct the F3 to Branxton link. The RTA would need to give notice of its intention to dredge or reclaim water land under Section 199 of the *Fisheries Management Act 1994*.

¹ The proposed design changes would affect *Eucalyptus parramattensis ssp. decadens* and *Grevillia parviflora*. The Sugarloaf realignment (a part of the proposed modification (Acacia Environmental Planning 2007b)) would affect *Tetratheca juncea*. The RTA would include all three species in the referral to the Department of the Environment and Heritage.

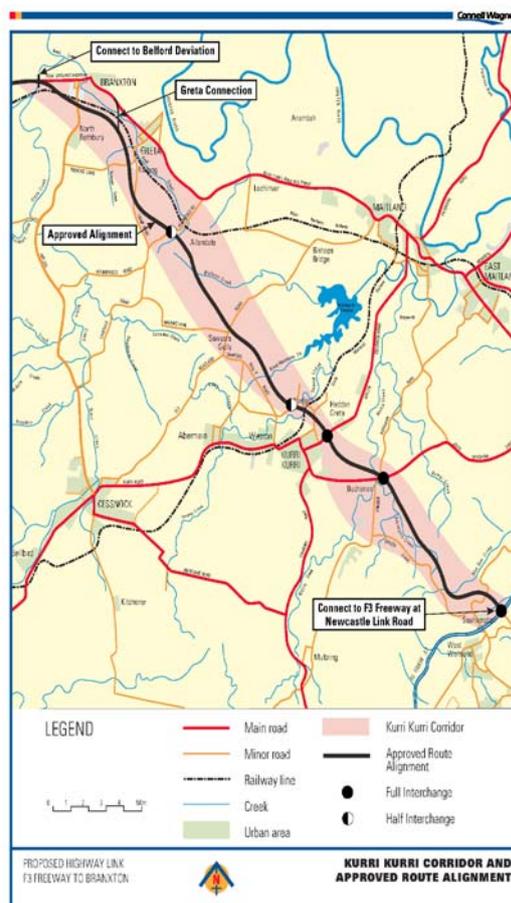
1 Introduction

1.1 The Approved Project

On behalf of the Australian and NSW governments, the Roads and Traffic Authority of NSW (RTA) proposes to construct a highway link between the F3 Freeway and Branxton (the F3 to Branxton link or the Link). The F3 to Branxton link would provide about 40 km of new dual carriageway between the F3 Freeway at Seahampton and the New England Highway west of Branxton. Figure 1 shows the location of the F3 to Branxton link.

The F3 to Branxton link was an activity that was assessed and determined under Part 5 of the *Environmental Planning and Assessment Act 1979* (the EP&A Act). It is within the Cessnock, Lake Macquarie, Maitland and Singleton local government areas.

Figure 1 Location of the F3 to Branxton link



In June 1995, Connell Wagner (1995) finalised the environmental impact statement (the EIS) for the RTA. Following introduction of the *Threatened Species Conservation Act 1995* (TSC Act) and consideration of impacts on threatened fauna, Connell Wagner (2001) finalised a fauna impact statement in January 1997 (the FIS). The RTA commissioned additional studies, including two reviews of environmental factors on detailed route selection between Allandale and Greta in 1998 and 2000.

The Director-General of the then National Parks and Wildlife granted concurrence subject to 15 conditions on 3 October 2001. The then Minister for Urban Affairs and Planning approved the F3 to Branxton link on 7 November 2001, subject to 129 conditions. On 1 August 2005, the Minister’s approval became a project approval under Part 3A of the *Environmental Planning and Assessment Act*

1979 (EP&A Act). This is the Approved Project. At the request of the RTA, the Minister modified the approval on 31 July 2006 to permit staged construction (but not opening). The F3 to Branxton link is included in the Australian Government’s AusLink National

Land Transport Plan. The RTA is progressing detailed design development, utility adjustments and property acquisition. The Link is subject to agreed funding between the Australian and NSW governments. Conditions of Approval and Conditions of Concurrence are presented in Appendix 1 and Appendix 2.

1.2 Review of the concept design

As discussed in Section 3, the RTA has undertaken an extensive review of the concept design (see the Glossary for definitions), on which the Minister's approval is based. The review identified ways to reduce impacts and identified the extent and impact of road-related ancillary infrastructure needed to construct the Approved Project.

The review identified 15 design changes that the RTA proposes to make to the Approved Project. Overall, they would reduce impacts on flora and fauna, as well as improve other traffic network, engineering and environmental outcomes. The RTA has also identified three types of road-related ancillary infrastructure -- construction and maintenance access, boundary and fauna exclusion fencing, and water quality controls -- that would require clearing of native vegetation.

The detailed concept design (see the Glossary for definitions) is the concept design for the Approved Project that incorporates the 15 proposed design changes and road-related ancillary infrastructure.

1.3 The proposed design changes

The F3 to Branxton link has a project approval under Part 3A EP&A Act. Section 75W regulates the modification of a project approved by the Minister. The RTA may modify the approved project, and will not need to obtain the Minister's modification of an approval, if the project as modified will be consistent with the Minister's approval.

The RTA prepared a consistency review for the 15 proposed design changes and the road-related ancillary infrastructure (Acacia Environmental Planning 2007). Based on the consistency review, the RTA has determined that three of the 15 proposed design changes, and the location of some water quality controls and boundary fencing, would be inconsistent with the Minister's approval:

The RTA described and assessed the three inconsistent design changes, the construction of water quality controls and boundary fencing in locations containing high conservation significance for flora, and the exceedance of the clearing limit in Condition of Approval 60 in an environmental assessment (Acacia Environmental Planning 2007b). The RTA intends to request that the Minister modify the approval to permit the proposed modification.

The remaining 12 of the 15 proposed design changes would be consistent with the Minister's approval. Section 2 describes the proposed design changes in detail. Appendix 3 shows plans of the 12 design changes.

1.4 Purpose of this report

This report is an environmental assessment that has three objectives:

1. To describe the proposed design changes to the Approved Project and establish why they are needed.
2. To assess the environmental impacts of the proposed design changes.
3. To identify environmental safeguards that the RTA would implement to reduce or avoid harmful impacts arising from the proposed design changes.

The RTA will provide this report to the NSW Department of Environment and Conservation (DEC) to satisfy Condition of Approval 112 and Condition of Concurrence 2.

1.5 Comparative assessments of vegetation clearing

The concept design for the Approved Project was not sufficiently detailed to accurately determine the extent of vegetation clearing. It did not include fully developed footprints for interchanges and ramps, and it excluded ancillary road-related infrastructure and utility relocations. Consequently, the vegetation clearing areas in Conditions of Approval 60 and 61 understate the vegetation clearing that would occur to construct the Approved Project. Condition of Concurrence 4 acknowledges these limitations with respect to road-related ancillary infrastructure.

Section 4.3 assesses the impacts of the 12 proposed design changes on flora and fauna. Among other things, it identifies the change in vegetation clearing between the concept design for the Approved Project and the detailed concept design, which incorporates the proposed design changes. Some elements of the detailed concept design may show an increase in vegetation clearing when compared to their equivalent elements in the concept design. However, if an accurate clearing footprint had been developed for the concept design, these elements of the detailed concept design would have similar or smaller vegetation clearing footprints.

2 Description of the 12 proposed design changes

The Approved Project is based on the concept design prepared for the EIS, as modified after exhibition of the RTA’s Representations Report (2001) to reduce the overall environmental impacts of the F3 to Branxton link. The proposed design changes are based on the RTA’s detailed concept design. Appendix 3 presents the plans of the detailed concept design for the 12 elements of the proposed design changes.

2.1 Design parameters

Key trigger: compliance with current road design standards

Approved project and proposed design changes

Design parameters for the Approved Project and the proposed design change are summarised in Table 1.

Table 1 Changes to design parameters of the concept design

Design Parameter	Approved Project	Change	Reason
Design speed	100 km/h	110 km/h	Current standard
Stopping sight distance	100 km/h @ 1.5 sec	110 km/h @ 2.5 sec	Current standard
Minimum curve radius	600 m	700 m	Higher design speed
Vertical grade			
Main carriageway	5%	5%	No change
Ramps	7%	8%	Reduce costs
Pavement widths			
Travel lanes	3.5 m	3.5 m	No change
Inner shoulder	1.0 m	0.5 m	Overall width unchanged
Outer shoulder	2.0 m	2.5 m	Overall width unchanged
Median width			
Sugarloaf section	3.6 m & Type F barrier	5.0 m and WRSB	Safety and design constraints
Remaining sections	17 m depressed	12 m depressed and WRSB	Safety and reduced vegetation clearing
Flooding	1% annual exceedance probability	1% annual exceedance probability	No change
Vertical clearance			
Over roads	5.3 m	6.5 m	Clearance for haulage to heavy industry in Hunter and beyond
Over rail	4.7 m	7.3 m	Clearance for double stacked containers

WRSB: wire rope safety barrier

2.2 Median Width

Approved project

The Approved Project generally adopts a 17 m median between Buchanan and Branxton. In the Sugarloaf Range, between the F3 Freeway and Buttai, about five kilometres of the F3 to Branxton link would have a narrow median of 3.6 m with a Type-F concrete barrier.

Proposed design change

Key trigger: improved ecological outcomes

The median between Buchanan and Branxton would generally be reduced to 12 m. This width could accommodate one additional lane along each carriageway should an additional travel lane for each carriageway be required to accommodate future traffic requirements. In the Sugarloaf Range, 6.3 km of the F3 to Branxton link would have a median of five metres. A barrier such as a wire rope safety fence would be located within the median. Additional travel lanes cannot be accommodated within the median through the Sugarloaf Range.

2.3 Newcastle interchange (Ch -500 to 900)

Approved project

The Newcastle interchange has roundabouts at the ramp terminals and a bridge spanning the F3 Freeway. The interchange accommodates all traffic movements, as shown in Table 2. The Newcastle Link Road to F3 southbound and the F3 northbound to the F3 to Branxton link are the only free-flow movements. The Approved Project would harm important Aboriginal and non-indigenous heritage items due to the construction of a culvert and a large fill batter over Minmi Creek.

Table 2 Approved Newcastle interchange movements

	Movement	Provision
1	F3 northbound to Newcastle Link Road	Yes, via roundabouts
2	F3 northbound to F3 to Branxton link	Yes, free flow
3	F3 southbound to Newcastle Link Road	Yes, via roundabout
4	F3 southbound to F3 to Branxton link	Yes, via roundabouts
5	F3 to Branxton link eastbound to F3 northbound	Yes, via roundabout and existing reverse loop ramp
6	F3 to Branxton link eastbound to F3 southbound	Yes, via roundabouts
7	F3 to Branxton link eastbound to Newcastle Link Road	Yes, via roundabouts
8	Newcastle Link Road westbound to F3 northbound	Yes, via roundabouts, overbridge and existing reverse loop ramp
9	Newcastle Link Road westbound to F3 southbound	Yes, free flow
10	Newcastle Link Road westbound to F3 to Branxton link	Yes, via roundabouts

Proposed design change

Key triggers: traffic safety and capacity, Aboriginal and non-indigenous heritage

The Newcastle interchange would be a free-flow interchange. It would accommodate the same traffic movements as the Approved Project, except that two extremely low volume movements (from the F3 southbound to the F3 to Branxton link westbound and the F3 to Branxton link eastbound to the F3 northbound) would be achieved by indirect movements. Direct routes for these two movements are available using John Renshaw Drive. Table 3 shows that all but the two indirect traffic movements would be free-flow and operate at higher speeds than the roundabouts in the Approved Project.

A cycleway would be constructed in the shoulder of the eastbound carriageway of the F3 to Branxton link and Newcastle Link Road. The proposed design change would provide four bridges over Minimi Creek to protect Aboriginal and non-indigenous heritage in Minimi Creek.

Table 3 Proposed Newcastle interchange movements

	Movement	Provision
1	F3 northbound to Newcastle Link Road	Yes, via free-flow ramp
2	F3 northbound to F3 to Branxton link	Yes, via free-flow ramp
3	F3 southbound to Newcastle Link Road	Yes, via existing free-flow ramp
4	F3 southbound to F3 to Branxton link	No, but access can be achieved via indirect movement to Newcastle Link Road, U-turn at Cameron Park Drive roundabout, and return across F3 Freeway
5	F3 to Branxton link eastbound to F3 northbound	No, but access can be achieved via indirect movement across F3 Freeway, U-turn at Cameron Park Drive roundabout, and back to existing reverse loop ramp
6	F3 to Branxton link eastbound to F3 southbound	Yes, via free-flow ramp
7	F3 to Branxton link eastbound to Newcastle Link Road	Yes, via bridges over ramps and F3 Freeway
8	Newcastle Link Road westbound to F3 northbound	Yes, via overbridge and existing reverse loop ramp
9	Newcastle Link Road westbound to F3 southbound	Yes, via existing free-flow ramp
10	Newcastle Link Road westbound to F3 to Branxton link	Yes, via bridges over ramps and F3 Freeway

2.4 Surveyors Creek realignment (Ch 5300 to 8700)

Approved project

The F3 to Branxton link is located at the base of a side slope in the Buttai. The RTA made a commitment to constructing combined sedimentation basins/water storage ponds on the northern side of the Link at Buttai to provide a permanent water supply for animals.

Proposed design change

Key trigger: reduced vegetation clearing

The F3 to Branxton link would be located to the southwest of the Approved Project between Ch 5300 and 8700. The maximum separation between the Approved Project and the proposed design change would be about 200 m near Ch 7200. When compared to the Approved Project, it would be about 70 m longer. However, it would reduce the volume of earthworks and the height of the fill centred at Ch 7300.

The proposed design change would reduce the area of native vegetation clearing. A combined heavy and light vehicle rest area would be located on both sides of the F3 to Branxton link at Buttai, between Ch 7500 and 8000. Combined sedimentation basins/water supply ponds for animals would not be provided.

2.5 Buchanan interchange (Ch 9900)

Approved project

At the Buchanan interchange, the F3 to Branxton link passes under John Renshaw Drive and provides onload and offload ramps to a roundabout, a T-intersection and a slip lane at John Renshaw Drive. Buchanan Road passes over the F3 to Branxton link and connects to John Renshaw Drive and George Booth Drive at a roundabout. Table 4 highlights (in yellow) important heavy vehicle hauling movements between the Hunter Valley and the Port of Newcastle.

Proposed design change

Key triggers: improved traffic movements, reduced vegetation clearing

Buchanan interchange would be a two lane, grade-separated elliptical roundabout. John Renshaw Drive would be realigned to join the north and south facing ramps of the Buchanan interchange and cross over the F3 to Branxton link on two two-lane bridges. The roundabout at the intersection of John Renshaw Drive and George Booth Drive would be moved slightly north to provide a suitable alignment for new bridges on John Renshaw Drive over Wallis and Surveyors creeks. Buchanan Road would cross under the F3 to Branxton link to join the roundabout at the intersection of John Renshaw Drive and George Booth Drive. Table 5 highlights (in yellow) important heavy vehicle hauling movements between the Hunter Valley and the Port of Newcastle.

2.6 Averys Lane overpass (Ch 11500)

Approved Project

Averys Lane crosses over the F3 to Branxton link at Ch 11500. The alignment is centred on the constructed formation of Averys Lane.

Table 4 Approved Buchanan interchange movements

	Movement	Provision
1	F3 to Branxton link westbound to JRD ¹ eastbound	Yes, indirect via roundabouts
2	F3 to Branxton link westbound to JRD westbound	Yes, via roundabout
3	F3 to Branxton link eastbound to JRD eastbound	Yes, via roundabout
4	F3 to Branxton link eastbound to JRD westbound	Yes, via roundabouts
5	F3 to Branxton link westbound to Buchanan Road	Yes, via roundabout and bridge over the F3 to Branxton link
6	F3 to Branxton link eastbound to Buchanan Road	Yes, indirect via roundabouts and bridge over the F3 to Branxton link
7	Buchanan Road to F3 to Branxton link westbound	Yes, indirect via bridge over the F3 to Branxton link, roundabout and loop ramp
8	Buchanan Road to F3 to Branxton link eastbound	Yes, indirect via bridge over the F3 to Branxton link and roundabouts
9	JRD westbound to F3 to Branxton link eastbound	Yes, via roundabout
10	JRD westbound to F3 to Branxton link westbound	Yes, via T-intersection
11	JRD eastbound to F3 to Branxton link eastbound	Yes, via roundabouts
12	JRD eastbound to F3 to Branxton link westbound	Yes, via roundabout and loop ramp

1: John Renshaw Drive

Table 5 Proposed Buchanan interchange movements

	Movement	Provision
1	F3 to Branxton link westbound to JRD ¹ eastbound	Yes, via roundabout
2	F3 to Branxton link westbound to JRD westbound	Yes, via roundabout
3	F3 to Branxton link eastbound to JRD eastbound	Yes, via roundabout
4	F3 to Branxton link eastbound to JRD westbound	Yes, via roundabout
5	F3 to Branxton link westbound to Buchanan Road	Yes, indirect via roundabouts and crossing under the F3 to Branxton link
6	F3 to Branxton link eastbound to Buchanan Road	Yes, indirect via roundabouts and crossing under the F3 to Branxton link
7	Buchanan Road to F3 to Branxton link westbound	Yes, indirect via crossing under the F3 to Branxton link and roundabouts
8	Buchanan Road to F3 to Branxton link eastbound	Yes, indirect via crossing under the F3 to Branxton link and roundabouts
9	JRD westbound to F3 to Branxton link eastbound	Yes, via roundabout
10	JRD westbound to F3 to Branxton link westbound	Yes, via roundabout
11	JRD eastbound to F3 to Branxton link eastbound	Yes, via roundabouts
12	JRD eastbound to F3 to Branxton link westbound	Yes, via roundabouts

1: John Renshaw Drive

Proposed design change

Key trigger: construction under traffic

The alignment of the Averys Lane bridge would be moved up to 10 m to the west to facilitate construction under traffic. After completion of the bridge, the approaches from

Averys Lane would be diverted and its existing formation between the approaches and the F3 to Branxton link would be closed.

2.7 McLeod Road overpass (Ch 15000)

Approved project

McLeod Road is realigned to cross the F3 to Branxton link on a bridge at the edge of a cutting. It connects at a T-intersection with a new road linking McLeod Road to the Kurri Kurri TAFE.

Proposed design change

Key trigger: design refinement

The bridge over the F3 to Branxton link would be moved from the edge to the centre of the cut to reduce ramp earthworks.

2.8 South Maitland Railway and Swamp Creek (Ch 15800)

Approved project

The F3 to Branxton link rises to cross over both the South Maitland Railway and Swamp Creek on separate bridges for each carriageway. The bridges over the South Maitland Railway would be 150 m long and provide 4.7 m clearance for railway traffic. The South Maitland Railway is listed as an item of environmental heritage on two environmental planning instruments (the *Hunter Regional Environmental Plan 1989* and the *Cessnock Local Environmental Plan 1989*).

The level of Swamp Creek is about 13 m below the level of the railway line in normal flow conditions and 6.5 m below in flood conditions. Large fill embankments and bridge abutments are required to gain the required elevation and will require clearing of Kurri Sand Swamp Woodland.

Proposed design change

Key triggers: provide additional rail clearance, design refinement

The owners of the South Maitland Railway require the option to move double-stacked containers on the railway. The minimum clearance would increase from 4.7 m to 7.3 m. To achieve this clearance, the RTA would need to lift the height of the bridges over the South Maitland Railway. This would increase the length of the bridges, increase visual impacts, require additional fill for the bridge abutments and result in more clearing of native vegetation.

To provide the track clearance required for the South Maitland Railway, the design would be changed to allow the Railway to cross over the F3 to Branxton link. The formation of the Railway would be raised over a distance of about 900 m and a rail bridge would be built over the F3 to Branxton link.

The F3 to Branxton link would be lowered to cross in a cutting below the South Maitland Railway and above Swamp Creek on bridges that would be 55 m long. The height of the Swamp Creek embankments and the extent of bridge abutments would be reduced when compared to the Approved Project. This design change would reduce the area of Kurri Sand Swamp Woodland to be cleared for the bridge approaches and abutments.

The part of the proposed design change that affects the South Maitland Railway requires development consent from Cessnock City Council and is not a part of the Approved Project. The RTA received development consent in 2006. Clearing associated with this development is separate from the Approved Project and does not contribute towards the clearing limits in Conditions of Approval 60 and 61.

2.9 Loxford interchange (Ch 16600)

Approved project

The Loxford interchange is a half diamond configuration and provides east-facing ramps to the F3 to Branxton link. A westbound offload ramp from the F3 to Branxton link provides access to Hart Road at a T-intersection. A T-intersection and onload ramp from Hart Road provide access to the eastbound F3 to Branxton link. Hart Road crosses over the F3 to Branxton link.

Proposed design change

Key trigger: construction under traffic

The alignment of the Hart Road bridge would be moved up to 20 m to the northwest to facilitate construction under traffic. Native vegetation remnants in the road reserve would be cleared. The Hart Road embankment would slightly increase clearing of Lower Hunter Spotted Gum-Ironbark Forest. The alignment of the two ramps would be moved to the southwest up to 20 m to provide suitable intersection geometry.

2.10 Sawyers Gully realignment (Ch 20000 to 22300)

Approved project

The Approved Project crosses 132 kV and 66 kV electricity transmission lines that will need to be relocated. Old Maitland Road crosses over the F3 to Branxton link at Ch 21600. The alignment is centred on the constructed formation of Old Maitland Road.

Proposed design change

Key triggers: eliminate 132 kV electricity crossings, construction under traffic

The alignment of the F3 to Branxton link would be moved up to 70 m to the north to move the construction footprint into the existing cleared electricity easements. The electricity easement would be relocated to the south of the Approved Project. The design change would eliminate all electricity line crossings of the F3 to Branxton link at this location. The alignment of the Old Maitland Road bridge would be moved up to 25 m to the east to facilitate construction under traffic.

2.11 Allandale interchange (Ch 27500)

Approved project

The Allandale interchange at Lovedale Road is a half diamond configuration with roundabouts and provides east-facing ramps to the F3 to Branxton link. A westbound offload ramp from the F3 to Branxton link provides access to Lovedale Road at a roundabout. A roundabout and onload ramp from Lovedale Road provide access to the eastbound F3 to Branxton link. Lovedale Road crosses over the F3 to Branxton link. A private road that provides access between Lovedale Road and the Allandale Quarry would be realigned.

Proposed design change

Key trigger: reduced vegetation clearing, design refinement

The Allandale interchange would have a dumbbell configuration with two roundabouts, southeast-facing ramps, and a bridge over the F3 to Branxton link connecting the roundabouts. The northeast roundabout would be located on the existing alignment of Lovedale Road; the southwest roundabout would be offset 140 m south of the existing alignment of Lovedale Road.

Lovedale Road would be realigned to the southwest and cross over the F3 to Branxton link on a shorter bridge where the F3 to Branxton link is in a cutting. The southeast-facing ramps would connect to the roundabouts and accommodate the same traffic movements as the Approved Project.

The existing T-intersection at the private road providing access to Allandale Quarry would be connected to the southwest roundabout and provide access to either carriageway of the F3 to Branxton link or Lovedale Road.

2.12 Camp Road underpass (Ch 30000)

Approved project

Camp Road crosses over the F3 to Branxton link on a skew bridge 150 m long. The F3 to Branxton link is in a cutting.

Proposed design change

Key trigger: design refinement

Camp Road would be re-aligned to cross under the F3 to Branxton link at a less acute angle. The length of the underpass under the F3 to Branxton link would be 35 m, a substantial reduction in length and cost when compared to the Approved Project.

3 Need for the proposed design changes

3.1 Overview

The Concurrence Report by the Director-General of National Parks and Wildlife (NPWS 2001) noted that due to a lack of detailed design information, it was not possible to determine if impacts on threatened flora and fauna could be reduced by modifying the concept design. Condition of Concurrence 3 requires the RTA to refine the design to reduce direct and indirect impacts on flora and fauna. Condition of Concurrence 2 requires the RTA to gain approval from the Director-General for design changes and modifications that could affect threatened species, populations or endangered ecological communities. Condition of Concurrence 4 requires the RTA to assess the impacts of road-related ancillary infrastructure (fencing, water quality controls, access and utility relocations) that had not been identified in the concept design.

The Section 115C report by the Director-General of the Department of Urban Affairs and Planning (DUAP 2001) noted that there was scope to reduce direct and indirect impacts on flora and fauna when the detailed design was prepared. Condition of Approval 53 requires the RTA to engage an independent road design specialist and ecologist to review the detailed design to further reduce direct and indirect impacts on flora and fauna. Condition of Approval 54 requires the RTA to provide a dedicated fauna overpass at Stockrington Road unless it is not possible to provide the fauna overpass at this location, or the proposed multi-function overpass is an effective and appropriate design.

The RTA, and the project's independent ecologist and road designer, have undertaken an extensive review of the concept design for the Approved Project, on which the Minister's approval is based, to investigate ways to reduce the impacts of the Approved Project. They have developed 15 proposed design changes. Overall, they would reduce impacts on flora and fauna, as well as improving other traffic network, engineering and environmental outcomes.

The report *Independent Design Review Conditions of Approval 53 and 54* (Acacia Environmental Planning 2007a) describes the 15 proposed design changes and road-related ancillary infrastructure, and documents the independent reviews by the road designer and ecologist. The report demonstrates that the proposed design changes (excluding road-related ancillary infrastructure) would reduce the overall direct and indirect impacts on flora and fauna when compared to the Approved Project. The 12 design changes would produce better ecological outcomes than the Approved Project, as summarised in Table 6.

Table 6 Ecological outcomes of the 12 design changes

Design change	Change in native vegetation clearing	Overall ecological outcome
Design parameters	No net change	Neutral
Median width	Reduction of about 8 ha	Positive
Newcastle interchange	Increase of 3.8 ha, but qualified by the circumstances discussed in Section 1.5. Would improve habitat connectivity at Minmi Creek.	Positive
Surveyors Creek realignment	Reduction of 3.3 ha.	Positive
Buchanan interchange	Increase of 1.5 ha, but qualified by the circumstances discussed in Section 1.5.	Positive
Averys Lane overpass	Increase of 0.4 ha in Alluvial Tall Moist Forest	Negative
McLeod Road overpass	Reduction of 0.2 ha in the Kurri Sand Swamp Woodland Endangered Ecological Community.	Positive
Swamp Creek Bridge	Reduction of 1.0 ha in total; reduction of 0.5 ha in the Kurri Sand Swamp Woodland EEC.	Positive
Loxford interchange	Increase of 1.2 ha, but qualified by the circumstances discussed in Section 1.5.	Neutral
Sawyers Gully realignment	Reduction of 1.1 ha.	Positive
Allandale interchange	Reduction of 0.1 ha.	Positive
Camp Road underpass	Reduction of 1.7 ha.	Positive

Source: *Independent Design Review Report (Acacia Environmental Planning 2007a)*

Most of the 12 proposed design changes would improve ecological outcomes when compared to the Approved Project.

3.2 Design refinements

The concept design for the Approved Project has road design features that do not optimise traffic network performance or efficiency. The design change at the Newcastle interchange would increase free-flow movements when compared to the Approved Project. The design change at the Buchanan interchange would more efficiently accommodate anticipated heavy vehicle movements between the Hunter Valley and the Port of Newcastle. Design changes at the Loxford and Allandale interchanges would optimise traffic connections with the local road network.

The design change at Surveyors Creek would reduce bulk earthworks. The design changes at Averys Lane, McLeod Road and Sawyers Gully would permit construction under traffic, and thereby reduce delays on the local road network during construction.

4 Environmental assessment of the proposed design changes

4.1 Approach to environmental assessment

The EIS and FIS prepared by Connell Wagner (1995, 1997) and the Representations Report (RTA 2001) provide substantial information on the environmental impacts of the Approved Project and the safeguards that would be implemented to reduce or avoid adverse impacts.

The Conditions of Approval and Conditions of Concurrence would apply to the Approved Project and to any design changes or modifications that the RTA proposes. The environmental assessment in this report focuses on new or changed impacts from the proposed design changes that the existing Conditions of Approval or Conditions of Concurrence may or could not have anticipated.

Consequently, for those aspects of the proposed design changes that have similar environmental impacts to those of the Approved Project, the RTA does not propose to implement additional safeguards. It would implement the existing environmental requirements in the Conditions of Approval and Conditions of Concurrence.

4.2 Soil and water quality

Description

The F3 to Branxton link crosses three coal measure groups: the Greta Coal Measures, the Tomago Coal Measures and the Newcastle Coal Measures. At least nine disused underground coal mines occur under or near the F3 to Branxton link. The F3 to Branxton link crosses directly over disused mines in the Sugarloaf Range, Heddon Greta and Greta.

The F3 to Branxton link crosses approximately 16 soil types. Loams over silty clay loams occur across the Sugarloaf Range and progress to alluvial soils on the floodplain at the base of the Range and in swamps and wider stream valleys. The remainder of the F3 to Branxton link crosses podsoles, generally with a clayey subsoil. These soils are susceptible to erosion.

The F3 to Branxton link traverses numerous small creeks and watercourses, and three large creek systems at Wallis Creek, Swamp Creek and Black Creek. All of these creeks are affected by backwater from the Hunter River during major floods. The F3 to Branxton link would cross watercourses and creeks on either culverts or bridges. Their detailed design specifications would be determined by catchment hydrology and hydraulic modelling. The flood design standard adopted for the F3 to Branxton link is to be flood free in a 1% annual exceedance probability flood event.

Water quality in the vicinity of the F3 to Branxton link is affected by past and present land uses in the catchments, including urban development, agriculture, roads, landfill waste disposal, mining and industry. Water quality testing undertaken in 1994 and 1995 showed that water quality was generally good, however faecal coliform counts exceeded ANZECC 1992 water quality standards at some locations. Bores in the area have varying depth and salinity ranges from brackish to very saline. Bore water is used for domestic and stock supplies, and for agricultural irrigation (Connell Wagner 1995).

Impacts

During construction of the Approved Project, clearing, earthworks, utility adjustments, and landscaping will expose soils and may cause erosion and sedimentation in downstream drainage paths and surface water. The operation of vehicles on roads allows a variety of pollutants, including particulates, nutrients, heavy metals, sulphates and organic matter to enter watercourses from road drainage. Many pollutants are carried in sediments from runoff.

The 12 proposed design changes would generally reduce the volume of bulk earthworks generated by cuttings or needed for fill embankments. Consequently, it would reduce the magnitude and extent of clearing and earthworks and potential erosion and sedimentation impacts in watercourses during construction.

The increase in the total clearing footprint, due to the recognition of road-related ancillary infrastructure, would extend the area that would be exposed during construction. Table 7 summarises the potential changes to the magnitude, extent or nature of impacts on soil and water quality for each of the 12 proposed design changes.

Existing environmental requirements

Condition of Approval 87 requires the RTA to prepare a detailed Soil and Water Management Sub Plan in accordance with the Department of Housing's guideline *Managing Urban Stormwater - Soils and Construction* and where appropriate, the former Department of Land and Water Conservation's publication *Constructed Wetlands Manual*. The Plan must form a part of the CEMP required by Condition of Approval 24.

Condition of Approval 88 requires the Soil and Water Management Sub Plan to address a range of issues including: management of stormwater on the quality of surface and groundwater; details of short and long-term measures to minimise soil erosion and sediment discharge (including the locations and sizes of sedimentation basins); management of impacts on watercourses; identification of sources of water pollution and remedial actions to minimise discharges of these pollutants; water quality monitoring before, during and after construction; contingency plans for fuel and other spills; and a program for reporting the effectiveness of soil and water quality management systems.

Table 7 Summary of soil and water quality impacts

Design change	Impacts on soil and water quality from the 12 proposed design changes	Safeguards
Design parameters	No change to the magnitude, extent or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Median width	General reduction to the extent of cuts and fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Newcastle interchange	General increase to the extent of cuts and fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Surveyors Creek realignment	General reduction to the extent and magnitude of cuts. No change to the nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Buchanan interchange	General increase to the extent of cuts and fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Averys Lane overpass	General increase to the extent of cuts and fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
McLeod Road overpass	General increase to the extent of fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Swamp Creek Bridge	General reduction to the extent and magnitude of fills. No change to the nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Loxford interchange	General increase to the extent of fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Sawyers Gully realignment	No change to the magnitude, extent or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Allandale interchange	General increase to the extent of fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed
Camp Road underpass	General increase to the extent of cuts and fills. No change to the magnitude or nature of impacts when compared to the Approved Project.	No additional safeguards proposed

Condition of Approval 89 requires the Soil and Water Management Sub Plan to include strategies for managing the extent of exposed ground surfaces during construction and progressive site rehabilitation requirements. Conditions of Approval 92 and 94 require the RTA to design, construct and operate stormwater drainage, erosion, sedimentation and water pollution control systems and facilities in accordance with certain guidelines. Condition of Approval 122 requires the RTA to prepare a Spoil Management Sub Plan to show how spoil would be handled, stockpiled, reused and disposed. Additional Conditions of Approval require inspection and monitoring of all drainage systems.

The existing Conditions of Approval are comprehensive and would be adequate to manage impacts on soil and water quality from construction and operation of the proposed design changes.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.3 Acid sulphate soils

Impacts

Potential acid sulphate soils can be exposed by excavation or lowering the water table, and produce acid runoff that harms aquatic ecosystems.

Based on mapping provided to the RTA by the former Department of Land and Water Conservation, the occurrence of potential acid sulphate soils is limited to an area between Wallis and Surveyors creeks and Averys Lane, from Ch 10400 to Ch 11400. They have a low probability of occurrence. Two sedimentation basins east of Averys Lane would be located in this area. Geotechnical investigations undertaken by the RTA in 2004 and 2005 indicated that acid sulphate soils are not present in the road corridor. The proposed modification would not substantially alter the likelihood of encountering or exposing acid sulphate soils.

Existing environmental requirements

Condition of Approval 30 requires the RTA to prepare Construction Method Statements for all construction methods and major construction work sites as part of the Construction Environmental Management Plan (CEMP) required by Condition of Approval 24. The Statements must, among other things, address the detection and management of acid sulphate soils. The RTA would follow its acid sulphate soils testing procedures and the procedures outlined in ASSMAC (1998) to detect and manage potential and actual acid sulphate soils. The existing Conditions of Approval would be adequate to manage impacts from the exposure of potential or actual acid sulphate soils.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.4 Terrestrial flora and fauna

Vegetation mapping

2001 vegetation mapping

Vegetation clearing figures that were presented in the EIS (Connell Wagner 1995) and the Representations Report (RTA 2001) were based on vegetation polygons delineated from aerial photography and limited ground-truthing. Although the vegetation polygons within the concept design footprint were delineated, they were not delineated for the

surrounding areas. These vegetation polygons are referred to as the *2001 mapping*. Clearing limits in Conditions of Approval 60 and 61 were taken from Table 3.1 in Appendix K of the Representations Report (RTA 2001) and are derived from the 2001 mapping.

2005 vegetation mapping

Since 2001, Biosis Research has used Lower Hunter and Central Coast Regional Environmental Management Strategy (LHCCREMS) vegetation mapping and updated it using 2003/2004 high-resolution aerial photography to better define vegetation community boundaries. Biosis Research has also updated the mapping to incorporate: the results of targeted flora surveys and selected ground-truthing; and threatened species and endangered ecological communities that have been gazetted since the approval in 2001. The updated LHCCREMS vegetation mapping is referred to as the *2005 mapping*.

Comparative assessments

To enable like-with-like comparisons between the concept design and the detailed concept design, the clearing footprint of the concept design was mapped onto the 2005 mapping. The detailed concept design would reduce the road clearing footprint when compared to the concept design². Total vegetation clearing would increase due to the recognition of road-related ancillary infrastructure required by Condition of Concurrence 4.

Impacts

Overall vegetation clearing

Biosis Research (Harrington, et al 2007) assessed the impacts of the 15 proposed design changes to the Approved Project, and the impacts of the detailed concept design (the Approved Project including the 15 proposed design changes and road-related ancillary infrastructure) as a whole, on threatened terrestrial flora and fauna. Impacts related to the 12 proposed design changes are summarised below.

Table 8 summaries vegetation clearing figures for the concept design, and the 15 proposed design changes and road-related ancillary infrastructure (which include the 12 proposed design changes). The concept design with the 15 proposed design changes (excluding road-related ancillary infrastructure) would reduce clearing of native vegetation by 11 ha and the area of Kurri Sand Swamp Woodland by 1.9 ha. It would reduce clearing of endangered ecological communities by 12 ha. Road-related ancillary infrastructure would increase clearing across all vegetation communities by 25 ha. The proposed design changes, when considered as a whole, would result in the clearing of 182 ha of native vegetation and 33.7 ha of Kurri Sand Swamp Woodland.

² See Section 1.5. The concept design does not include modelled interchanges and ramps and therefore the clearing footprint of the concept design understates realistic vegetation clearing. Some elements of the detailed concept design may show an increase in vegetation clearing when compared to the equivalent element in the concept design.

Table 8 Summary of native vegetation clearing

Vegetation community	EEC	2001 Mapping		2005 Mapping		2005 Mapping		2005 Mapping Road-related ancillary infrastructure	=	2005 Mapping Detailed Concept Design ²
		Concept Design ¹	Concept Design	Concept Design	Concept Design with 15 proposed design changes	+				
Alluvial Tall Moist Forest	No	9.1	6.6	7.6	1.0			8.6		
Central Hunter Ironbark-Spotted Gum Grey Box Forest	No	Not defined	8.8	7.7	1.0			8.8		
Central Hunter Riparian Forest	Yes	0.6	6.2	4.9	1.0			5.9		
Coastal Foothills Spotted Gum-Ironbark Forest	No	22.5	13.3	9.7	0.5			10.2		
Coastal Plains Smooth-barked Apple Woodland	No	19.4	12.1	16.9	1.0			17.9		
Hunter Lowland Redgum Forest	Yes	16.1	15.6	13.7	3.1			16.8		
Hunter Valley Moist Forest	No	Not defined	1.0	0.9	0.2			1.2		
Kurri Sand Swamp Woodland	Yes	33.7	28.5	26.6	7.1			33.7		
Lower Hunter Spotted Gum-Ironbark Forest	Yes	67.0	75.0	68.5	9.8			78.3		
All native vegetation (rounded to nearest hectare)		168	167	157	25			182		

Note 1: Taken from Table 3.1 in Appendix K of the Representations Report (RTA 2001). Conditions of Approval 60 and 61 are based on these figures.

Note 2: The detailed concept design is the concept design incorporating the 15 proposed design changes and road-related ancillary infrastructure.

All figures except column totals in hectares and rounded to the nearest tenth hectare. Column totals rounded to the nearest hectare.

Design parameters

Apart from the change to median width, the changes to the design parameters would result in minor changes to the extent of native vegetation clearing. These changes to clearing are included in the totals in Table 8.

Median width

The reduction in median width would reduce native vegetation clearing in all vegetation communities by a total of about eight hectares. These changes to clearing are included in the totals in Table 8.

Newcastle interchange

Although targeted surveys were not conducted for the changes to the Newcastle interchange, no threatened plant species were previously recorded within this area and no endangered ecological communities (EECs) were recorded within the footprint of the proposed design change. No threatened fauna species were previously recorded in this location, although the Sooty Owl *Tyto tenebricosa* was located about one kilometre northwest on the Stockrington Road Ridge (Harrington, et al 2007). The Masked Owl *Tyto novaehollandiae* has been previously recorded about 500 m west of this location (DEC Atlas of NSW Wildlife). Squirrel Gliders have also been detected in the vicinity of the Sugarloaf Range (Connell Wagner 1997).

The proposed design change would affect moderate quality Coastal Plains Smooth-barked Apple Woodland. This community is of moderate quality because it was previously logged, the mid-storey is sparse and ground cover is limited. It is also transected by tracks and easements and it is subject to rubbish dumping. Figure 2 shows that the proposed change would increase clearing in this vegetation community from 5.2 ha to 9.0 ha; it would also slightly increase fragmentation.

However, as noted in Section 1.5, the vegetation clearing for the Approved Project is understated. Importantly, the connectivity along Minmi Creek would be improved. This area falls within a DEC regional corridor, which extends from east of Mount Sugarloaf to the 'Tank Paddock'. The proposed bridges over Minmi Creek would allow uninterrupted fauna movement across the F3 to Branxton link within this recognised fauna corridor and would provide greater connectivity than the Approved Project. Improved connectivity in this area is considered more important than a slight increase in vegetation clearing of moderate quality Coastal Plains Smooth-barked Apple Woodland. The proposed design change at the Newcastle interchange is considered likely to reduce impacts on ecological values when compared to the Approved Project.

Surveyors Creek realignment

No threatened plant species were recorded within the footprint of this proposed design change. However, Lower Hunter Spotted Gum-Ironbark Forest, which is listed as an EEC on the TSC Act, would be affected. The Powerful Owl *Ninox strenua* has previously been recorded in this section (Harrington, et al 2007), and Squirrel Gliders have been detected in the vicinity of the Sugarloaf Range (Connell Wagner 1997).

Figure 3 shows that the proposed design change would have a positive ecological outcome because it would reduce clearing in two vegetation communities.

The provision of permanent water supply ponds for animals is not required due to the proximity of existing water supplies and the difficulties in maintaining suitable water quality.

Figure 2 Newcastle interchange vegetation changes

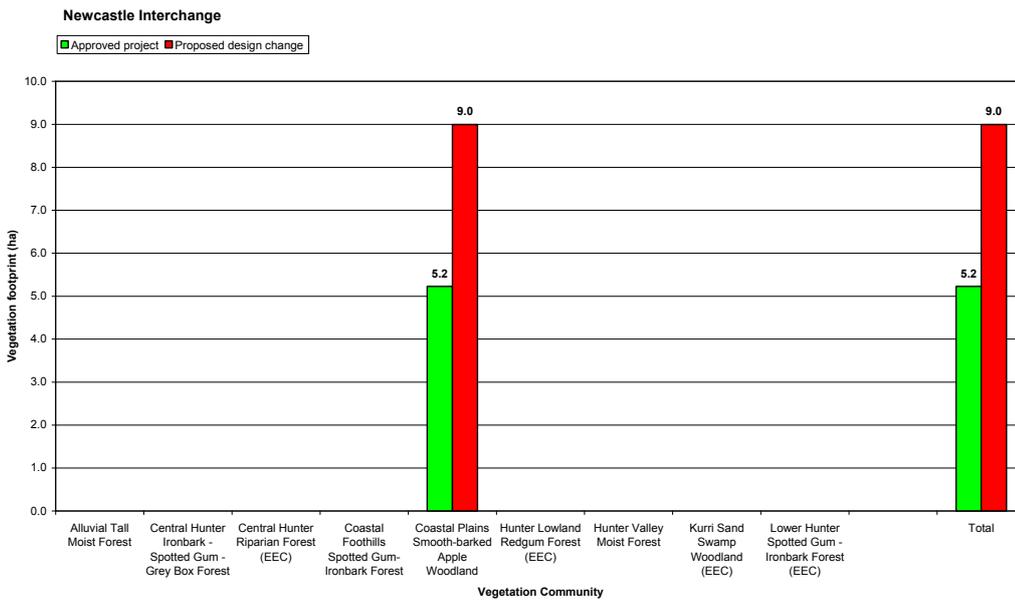
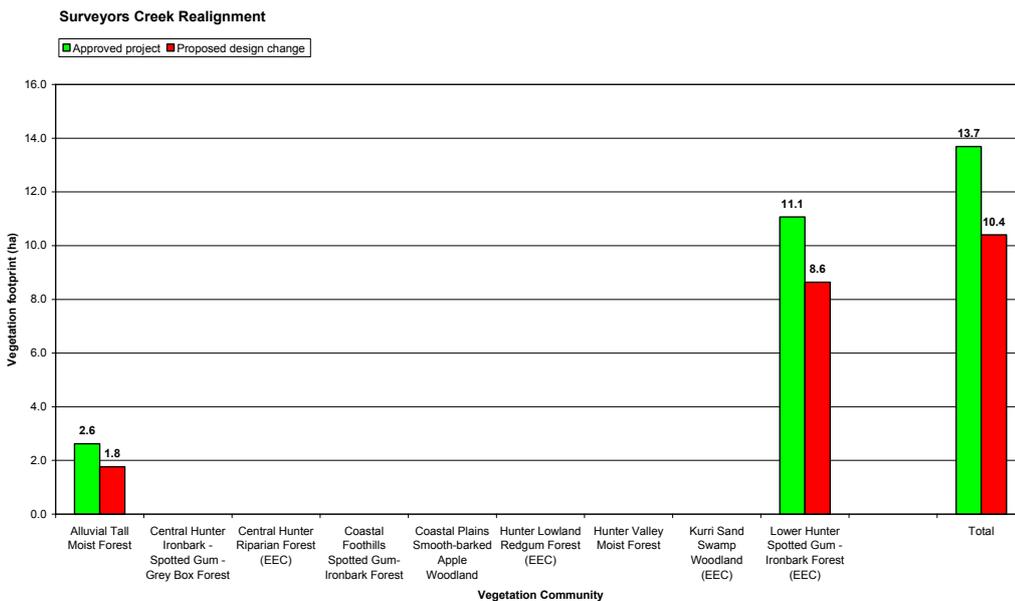


Figure 3 Surveyors Creek realignment, clearing changes



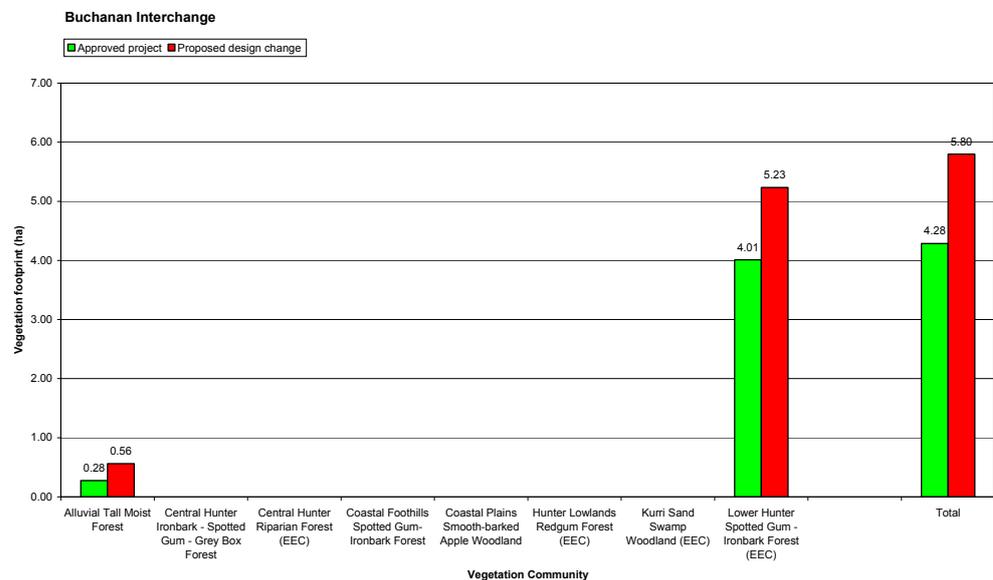
Buchanan interchange

No threatened plant species have been recorded in the footprint of the proposed design change at the Buchanan interchange. However, Lower Hunter Spotted Gum-Ironbark Forest, which is listed as an EEC on the TSC Act, would be affected. No threatened animal species have previously been located in the vicinity of the Buchanan interchange.

The proposed design change would have an impact on Lower Hunter Spotted Gum-Ironbark Forest and Alluvial Tall Moist Forest, both of which are of poor quality. Because these communities were previously logged, the mid-storey is absent and ground cover is dominated by introduced grasses and weeds. Both communities are subject to grazing impacts.

It was anticipated that the proposed design change would reduce vegetation clearing. However, the Approved Project lacks design information on the cuts and batters for the onload and offload ramps and roundabouts, and shows that vegetation between the ramps and the main carriageways would not be cleared. It therefore understates the vegetation clearing. Figure 4 shows that the proposed design change would increase clearing. As noted in Section 1.5, the actual vegetation clearing area is likely to be reduced. Despite the indicated increase in clearing area, the proposed design change would have a positive ecological outcome when compared to the Approved Project.

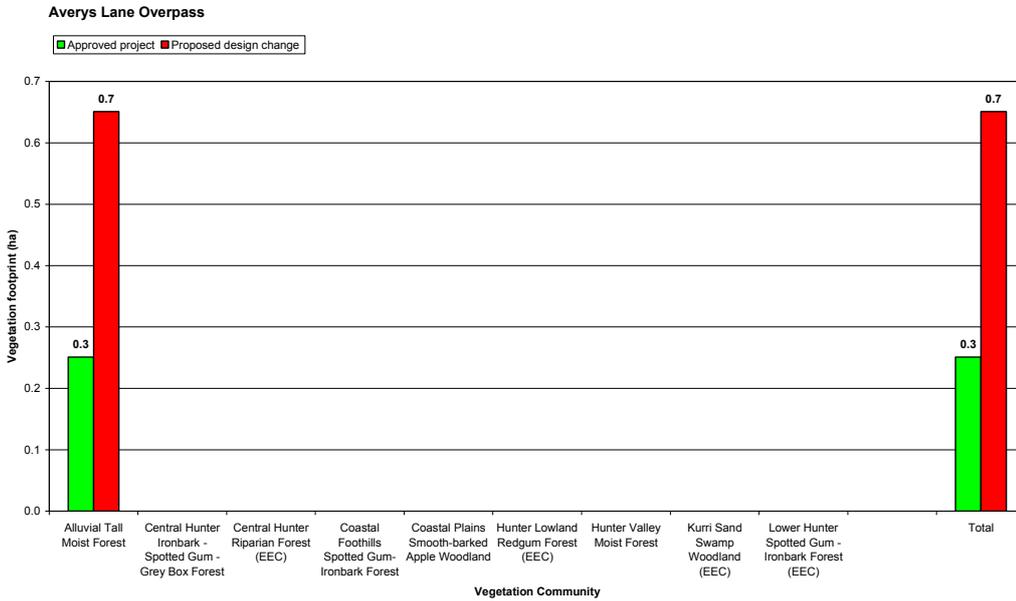
Figure 4 Buchanan interchange, clearing changes



Averys Lane overpass

No threatened plant species or EECs were recorded under the footprint of the design change for Averys Lane. No threatened animal species have been previously located near the Averys Lane overpass. Figure 5 shows that the proposed design change would increase vegetation clearing by 0.4 ha in the Alluvial Tall Moist Forest vegetation community.

Figure 5 Averys Lane overpass vegetation changes



McLeod Road overpass

Eucalyptus parramattensis ssp. *decadens*, a threatened species under the TSC Act and the EPBC Act, was recorded within the footprint of the proposed design change. Additionally, Kurri Sand Swamp Woodland, an EEC under the TSC Act, would be affected. No threatened animal species have been detected near the McLeod Road overpass, although Squirrel Gliders have been recorded in the Kurri Kurri area (DEC Atlas of NSW Wildlife).

The proposed design change would affect two small fragmented patches of good quality Kurri Sand Swamp Woodland. Roads, electricity easements, residential housing and a wastewater treatment plant surround the two patches of vegetation. Figure 6 shows that the proposed design change would have a positive ecological outcome because it would reduce clearing.

Swamp Creek Bridge

Eucalyptus parramattensis ssp. *decadens*, a threatened species, was previously recorded within the construction footprint of the Approved Project at Swamp Creek (Harrington, et al 2005). Additionally, Kurri Sand Swamp Woodland, an EEC under the TSC Act, would be affected. No threatened animal species have been detected near the proposed Swamp Creek Bridge, although Squirrel Gliders have been recorded in the Kurri Kurri area (DEC Atlas of NSW Wildlife).

The proposed design change would affect moderate quality Kurri Sand Swamp Woodland and Central Hunter Riparian Forest. Figure 7 shows that the proposed design change would have a positive ecological outcome because it would reduce clearing.

Figure 6 McLeod Road overpass, clearing changes

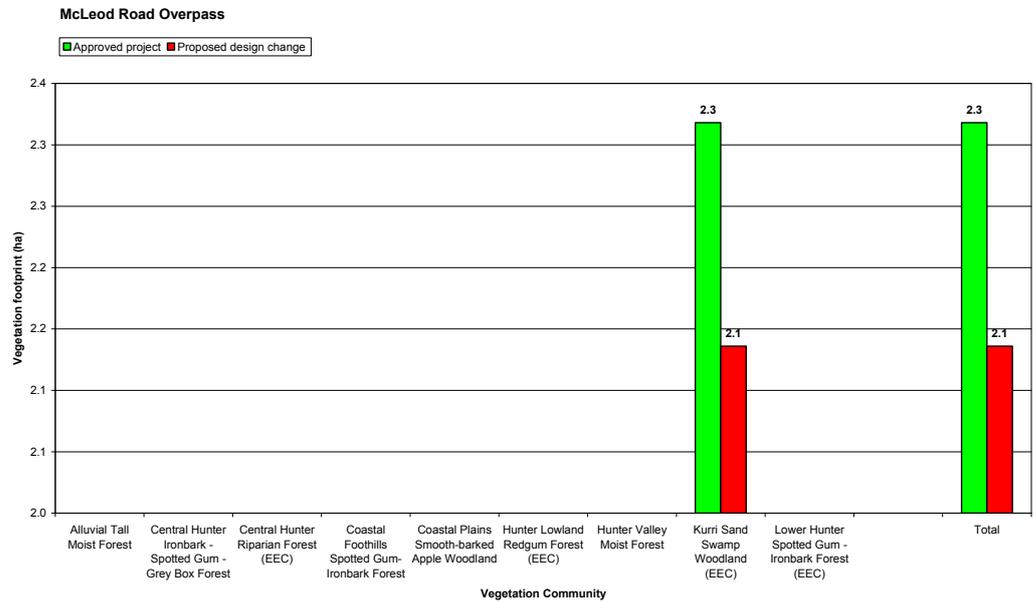
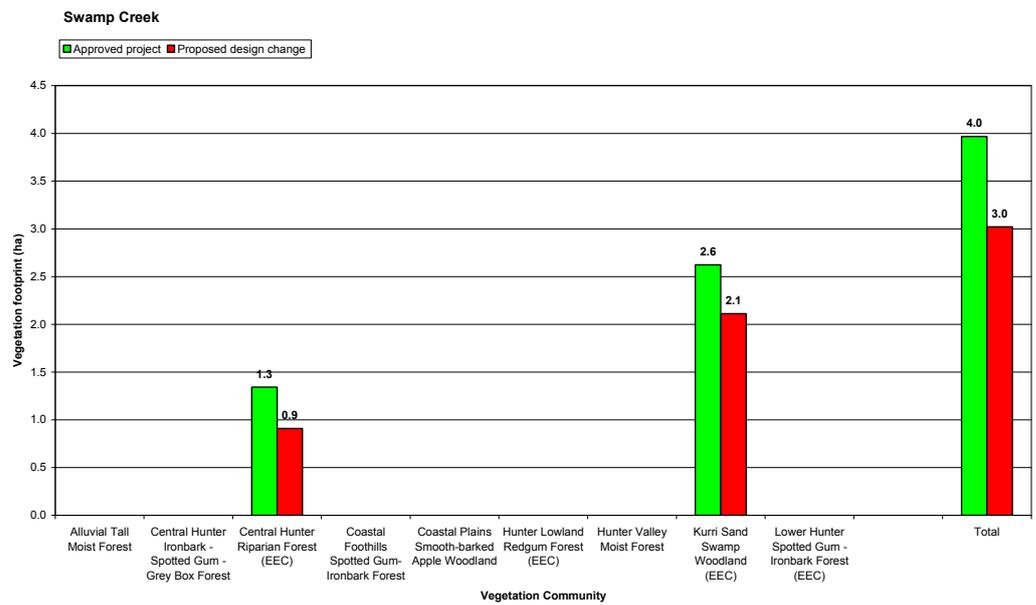


Figure 7 Swamp Creek Bridge, clearing changes



Loxford interchange

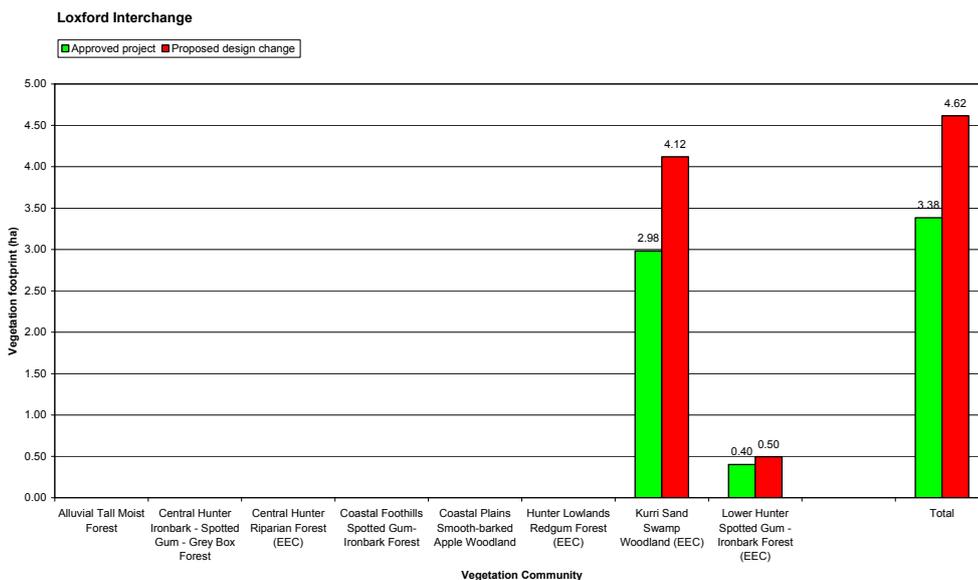
Eucalyptus parramattensis ssp. *decadens*, a threatened species, was recorded within the footprint of the proposed design change. Additionally, Kurri Sand Swamp Woodland and Lower Hunter Spotted Gum-Ironbark Forest, both EECs under the TSC Act, would be affected. No threatened animal species have been detected near the proposed Loxford interchange, although Squirrel Gliders have been recorded in the Kurri Kurri area (DEC Atlas of NSW Wildlife).

The onload and offload ramps of the proposed design change would affect the edges of a small patch of moderate quality Kurri Sand Swamp Woodland and Lower Hunter Spotted Gum-Ironbark Forest. Although the centre of this patch of Kurri Sand Swamp Woodland is of moderate to good condition, the areas affected by the proposed design change are of poor quality. They were previously cleared, have a weed-dominated ground cover, and are subject to grazing impacts.

It was anticipated that the proposed design change would slightly increase clearing. However, the Approved Project lacks design information on the cuts and fill batters for the onload and offload ramps and shows that the vegetated areas between the ramps and the main carriageways would not be cleared. It therefore understates the clearing area.

Figure 8 shows that the proposed design change at the Loxford interchange would increase clearing. As noted in Section 1.5, the actual vegetation clearing is likely to be unchanged. Despite the indicated increase in clearing, the proposed design change is unlikely to worsen the ecological outcome when compared to the Approved Project.

Figure 8 Loxford interchange vegetation changes



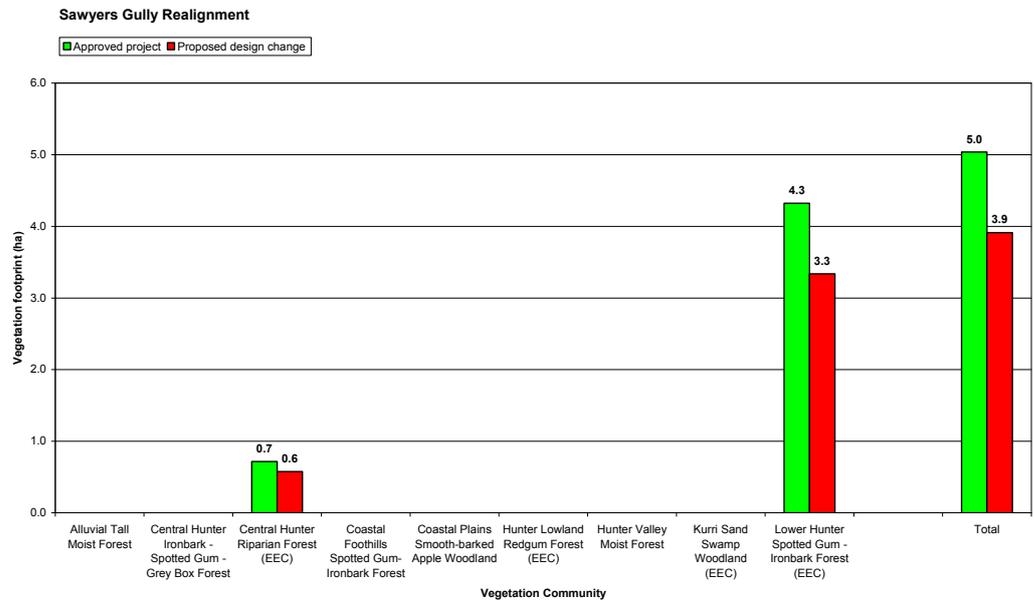
Sawyers Gully realignment

No threatened plant species were recorded within the construction footprint of the proposed design change. However, Lower Hunter Spotted Gum-Ironbark Forest and Central Hunter Riparian Forest, both EECs under the TSC Act, would be affected. No threatened animal species have been detected near Sawyers Gully.

The proposed design change would affect the edges of a large patch of moderate quality Lower Hunter Spotted Gum-Ironbark Forest and a small patch of Central Hunter Riparian Forest. Figure 9 shows that the proposed design change would have a positive ecological outcome because it would reduce clearing.

The relocation of overhead electricity transmission lines at Sawyers Gully would require clearing of native vegetation. EnergyAustralia is assessing the impacts of electricity adjustments separately to the F3 to Branxton link.

Figure 9 Sawyers Gully vegetation changes



Allandale interchange

No threatened plant species were recorded within the footprint of the proposed design change. However, Hunter Lowland Redgum Forest and Lower Hunter Spotted Gum-Ironbark Forest, both EECs on the TSC Act, would be affected. No threatened animal species have been detected near Lovedale Road, although Squirrel Gliders have been recorded on the route further to the north near Camp Road (Connell Wagner 1997, DEC Atlas of NSW Wildlife).

The proposed design change would affect the edges of a small patch of moderate quality Lower Hunter Spotted Gum-Ironbark Forest. Figure 10 shows that the proposed design change would have a positive ecological outcome because it would reduce clearing.

Camp Road underpass

The proposed design change would affect mostly farmland, although isolated trees of the Hunter Lowland Redgum Forest and Lower Hunter Spotted Gum-Ironbark Forest communities would be affected at the north and south end of the proposed design change. No habitat trees would be affected.

No threatened plant species were recorded within the footprint of the proposed design change. However, Hunter Lowland Redgum Forest and Lower Hunter Spotted Gum-Ironbark Forest, both EECs on the TSC Act, occur immediately adjacent to the new alignment. Squirrel Gliders have been previously recorded in the surrounding forest patches (Connell Wagner 1997, DEC Atlas of NSW Wildlife).

Figure 11 shows that the proposed design change would have a positive ecological outcome because it would reduce clearing.

Figure 10 Allandale interchange vegetation changes

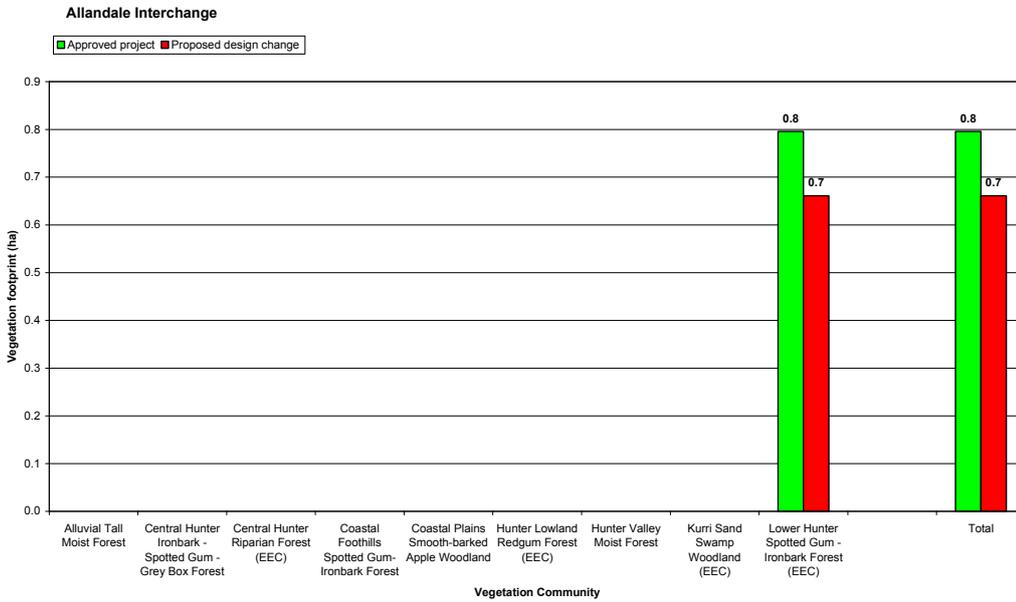
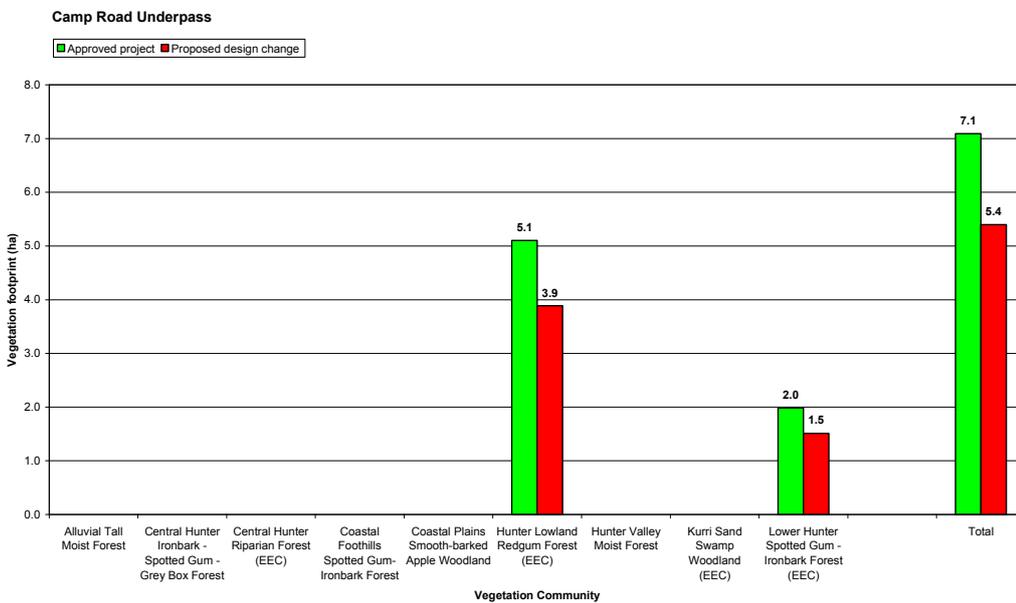


Figure 11 Camp Road vegetation changes



Construction and maintenance access

Construction and maintenance access would require additional clearing of native vegetation in all nine vegetation communities when compared to the Approved Project. The RTA has reduced the areas that would require clearing for construction and

maintenance access as far as practical and provided a more accurate clearing estimate than the concept design.

The vegetation clearing areas for the Approved Project with the 15 proposed design changes and road-related ancillary infrastructure presented in Table 8 include construction and maintenance access.

Boundary and fauna exclusion fencing

Boundary and fauna exclusion fencing would require additional clearing of native vegetation in all vegetation communities except Coastal Plains Smooth-barked Apple Woodland and Coastal Foothills Spotted Gum-Ironbark Forest when compared to the Approved Project. The total area of native vegetation that would be cleared for fencing would be 18.2 ha. The RTA has reduced the areas that would require clearing for boundary and fauna exclusion fencing as far as practical and provided a more accurate clearing estimate than the concept design.

The vegetation clearing areas for the Approved Project with the 15 proposed design changes and road-related ancillary infrastructure presented in Table 8 include clearing for fencing.

Some sections of boundary fencing would need to be located on land that has high conservation significance for flora, which would be inconsistent with Condition of Approval 129. The sections have a total clearing footprint of 16.8 ha. A separate report (Acacia Environmental Planning 2007b) considers these impacts.

Water quality controls

The construction and operation of stormwater quality controls would require additional clearing of native vegetation when compared to the Approved Project. The total area of native vegetation that would be cleared for water quality controls would be 6.4 ha across nine vegetation communities. The RTA has reduced the areas that would require clearing for water quality controls as far as is practical and provided a more accurate clearing estimate than the concept design.

The vegetation clearing areas for the Approved Project with the 15 proposed design changes and road-related ancillary infrastructure presented in Table 8 include all water quality controls.

Due to topography, some sedimentation basins would need to be located on land that has high conservation significance for flora, which would be inconsistent with Condition of Approval 129. They have a total clearing footprint of 4.2 ha. A separate report (Acacia Environmental Planning 2007b) considers these impacts.

Overview of threatened species and endangered ecological communities

Table 9 summarises the threatened species and endangered ecological communities where a significant impact (following the assessment process of the TSC Act) was likely to occur for the Approved Project and the detailed concept design, which includes the proposed modification (Harrington, et al 2007). It demonstrates that the detailed concept design would reduce the number of threatened animal species for which a significant impact under the TSC Act is likely to occur. The final determination for the Hunter Lowland Redgum Forest occurred in December 2002, after the F3 to Branxton link was granted concurrence.

Existing environmental requirements

Condition of Approval requires the RTA to prepare and implement a Flora and Fauna Management Sub Plan that must be consistent with Condition of Concurrence 15. The Sub Plan must be included in the CEMP required by Condition of Approval 24. The Sub Plan must address, among other things, strategies for seed collection and revegetation, a fauna risk assessment and suitable impact mitigation, and a weed management strategy.

Condition of Approval 52 requires the RTA to update the Additional Flora and Fauna Assessment in the Representations Report (RTA 2001). Biosis Research prepared a draft report that was provided to the DEC for comment. A report was finalised in 2005 to address comments raised by the DEC on the draft report (Harrington, et al 2005a).

Conditions of Approval 49 and 50, and Condition of Concurrence 13, require the RTA to provide a habitat package that compensates for the direct and indirect impacts on vegetation and habitat. The RTA and the NSW Department of Environment and Conservation have broadly agreed on compensatory habitat areas that take into account the changes to impacts on vegetation and habitat from the 15 proposed design changes.

Condition of Approval 54 requires the RTA to provide a dedicated fauna overpass at Stockrington Road unless it is not possible to provide the fauna overpass at this location, or the proposed multi-function overpass is an effective and appropriate design. Condition of Approval 55 requires the RTA to provide opportunities for the safe crossing of gliders. Condition of Approval 57 requires the RTA to identify and mark all remnant native vegetation, and threatened plants and communities, and to undertake pre-clearing surveys, to minimise disturbance to plants and animals during construction.

The detailed concept design, including the 12 proposed design changes which are an integral component, would contribute to an overall reduction in direct and indirect impacts on vegetation. The proposed design changes would cause the same types of impacts, in similar locations and within the same vegetation communities, as the construction and operation of the Approved Project is likely to cause. The existing Conditions of Approval and Concurrence are comprehensive and would be adequate to manage impacts on flora and fauna from construction and operation of the proposed design changes.

Table 9 Species for which a significant impact is likely to occur

	RTA 2001 ¹	Concurrence ²	Harrington, et al 2005a ³	Harrington, et al 2007 ⁴
EEC	Kurri Sand Swamp Woodland	Kurri Sand Swamp Woodland	<ul style="list-style-type: none"> • Kurri Sand Swamp Woodland • Hunter Lowland Redgum Forest 	<ul style="list-style-type: none"> • Kurri Sand Swamp Woodland • Hunter Lowland Redgum Forest
Threatened plant	<ul style="list-style-type: none"> • <i>Eucalyptus parramattensis</i> ssp. <i>decadens</i> • <i>Persoonia pauciflora</i> 	<ul style="list-style-type: none"> • <i>Eucalyptus parramattensis</i> ssp. <i>decadens</i> • <i>Grevillea parviflora</i> ssp. <i>parviflora</i> • <i>Persoonia pauciflora</i> 	<ul style="list-style-type: none"> • <i>Eucalyptus parramattensis</i> ssp. <i>decadens</i> • <i>Grevillea parviflora</i> ssp. <i>parviflora</i> • <i>Tetratheca juncea</i> 	<ul style="list-style-type: none"> • <i>Eucalyptus parramattensis</i> ssp. <i>decadens</i> • <i>Grevillea parviflora</i> ssp. <i>parviflora</i> • <i>Tetratheca juncea</i>
Threatened animal	<ul style="list-style-type: none"> • Yellow-bellied Sheathtail-bat • Eastern Little Mastiff-bat • Large Bent-wing Bat • Little Bent-wing Bat • Greater Broad-nosed Bat • Large-eared Pied Bat • Green and Golden Bell Frog 	<ul style="list-style-type: none"> • Yellow-bellied Sheathtail-bat • Eastern Little Mastiff-bat • Large Bent-wing Bat • Little Bent-wing Bat • Greater Broad-nosed Bat • Large-eared Pied Bat • Green and Golden Bell Frog • Powerful Owl • Masked Owl 	<ul style="list-style-type: none"> • Yellow-bellied Sheathtail-bat • Eastern Little Mastiff-bat • Large Bent-wing Bat • Little Bent-wing Bat • Greater Broad-nosed Bat • Large-eared Pied Bat • Woodland Birds (Brown Treecreeper, Speckled Warbler, Hooded Robin, Diamond Firetail and Grey-crowned Babbler) • Olive Whistler 	
Total	1 EEC 2 plants 7 animals	1 EEC 3 plants 9 animals	2 EECs 3 plants 12 animals	2 EECs 3 plants no animals

Note 1: Additional Flora and Fauna Assessment, Appendix F of the Representations Report (RTA 2001)

Note 2: Director-General's Concurrence Report (NPWS 2001)

Note 3: Update to the Additional Flora and Fauna Assessment, October 2005

Note 4: Threatened species assessment for the proposed design changes, including the proposed modification

The proposed design changes have been considered in the formulation of the compensatory habitat areas required by Conditions of Approval 49 and 50, and Condition of Concurrence 13. the effectiveness of the compensatory habitat would not be compromised by the proposed design changes.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.5 Aquatic flora and fauna

Biosis Research (Beitzel 2005) prepared a habitat assessment of the main waterway crossings for the detailed concept design, which includes the 12 proposed design changes. No threatened aquatic species, populations or endangered ecological communities were located during the surveys. In addition there are no threatened aquatic species, populations or endangered ecological communities listed under the *Fisheries Management Act 1994* and EPBC Act that have potential habitat within the F3 to Branxton link corridor.

Existing environmental requirements

There are no Conditions of Approval or Concurrence that specifically address management of impacts on aquatic flora or fauna. However, the existing environmental requirements noted in Section 4.4 would also apply to the management of aquatic flora and fauna impacts. In particular, the RTA must prepare the CEMP and Flora and Fauna Management Subplan in consultation with public authorities, including the Department of Primary Industries, to ensure that their requirements are addressed.

The proposed design changes would cause the same types of impacts, in similar locations, as the construction and operation of the Approved Project is likely to cause. The existing Conditions of Approval and Concurrence are comprehensive and would be adequate to manage impacts on aquatic flora and fauna from construction and operation of the proposed modification.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.6 Noise and vibration

Construction impacts

The proposed design changes would generally use the same construction methods and materials as the Approved Project and would not increase the duration of construction.

Operational impacts

In 2001, Atkins Acoustics and Associates (Appendix E in RTA 2001) updated the assessment presented in the EIS (Connell Wagner 1995) using road traffic noise assessment criteria in the DEC *Environmental Criteria for Road Traffic Noise* and the RTA *Environmental Noise Management Manual*. In 2005, the RTA engaged Atkins Acoustics and Associates to update its 2001 assessment to include the most recent forecast traffic data for the F3 to Branxton link, the 15 proposed design changes (which include the proposed modification), and the forecast opening year of 2010.

The updated assessment (Atkins Acoustics and Associates Pty Ltd 2007) shows that relevant noise assessment goals would be exceeded at many noise receivers near the F3 to Branxton link. However, the updated assessment finds that predicted road traffic noise

exceedances in Kurri Kurri, the Allandale rural community, Greta and Branxton could be reduced to satisfy relevant noise criteria by installing a combination of earth mounds and roadside barriers.

While the 12 proposed design changes would not substantially change the location or height of road traffic noise sources when compared to the concept design in the Approved Project, the noise models take into account traffic speeds that are consistent with the proposed geometric design parameters in Table 1.

Noise barriers (mounds, walls or a combination of both) would be required adjacent to the proposed Greta Estate development, between the Allandale interchange and the Camp Road overpass³. In areas with isolated residences, acoustic treatment to individual dwellings would be required to satisfy relevant road traffic noise criteria. All noise control options would be developed on the basis of practicality, cost effectiveness, equity, aesthetics and owner preference.

The updated assessment (Atkins Acoustics and Associates Pty Ltd 2007) also considered adverse weather conditions, particularly temperature inversions, that could increase road traffic noise levels. When compared to calm weather conditions, road traffic noise levels could increase by:

- 1 to 3 dB(A) during a temperature inversion of 3° /100 m.
- 2 to 5 dB(A) with a wind speed of 1.5 m/s towards the receivers.
- 4 to 10 dB(A) with a wind speed of 3 m/s towards the receivers.

Buchanan rest area

The proposed heavy/light vehicle rest area that is part of the proposed Surveyor Creek realignment would accommodate:

- 25 light vehicles and 15 heavy vehicles in the northbound rest area.
- 25 light vehicles and 18 heavy vehicles in the southbound rest area

There are no known residences near the proposed rest area.

Rest areas generate noise from stationary refrigerated trucks and transient activities associated with engine idling and revving, acceleration, deceleration, and air-brakes.

The updated assessment (Atkins Acoustics and Associates Pty Ltd 2007) identified the relevant noise assessment goals and estimated the use of the rest area by heavy vehicles. It found that the rest area would satisfy all relevant noise assessment goals.

Existing environmental requirements

³ Noise barriers are also required for the proposed modifications at Kurri Kurri, Tuckers Lane and Branxton and are considered in a separate report (Acacia Environmental Planning 2007b).

For both the Approved Project and the 12 proposed design changes, relevant road traffic noise criteria would be exceeded and noise controls would be required. The assessment of road traffic noise impacts and mitigation must be in accordance with the RTA *Environmental Noise Management Manual* and the DEC *Environmental Criteria for Road Traffic Noise*.

The RTA must manage the construction noise and vibration impacts of the F3 to Branxton link. Condition of Approval 71 requires the RTA to prepare and implement a comprehensive Noise and Vibration Management Sub Plan. The Sub Plan must be included in the CEMP required by Condition of Approval 24. The Sub Plan must address, among other things, the management of noise and vibration during construction, construction noise monitoring, and complaint response.

Condition of Approval 72 requires the RTA to ensure that impulsive noise, such as rock breaking or sheet piling, is limited and to provide respite periods. Conditions of Approval 73 and 74 limit work hours and clarify activities that can be undertaken outside of work hours. Condition of Approval 75 requires the RTA to put construction noise mitigation measures in place before construction begins. Conditions of Approval 77 to 83 require the RTA to manage construction blasting and vibration impacts, including the provision of advance notice and reduced work hours.

The RTA must manage the operational noise impacts of the F3 to Branxton link. Condition of Approval 84 requires the RTA to prepare and implement a comprehensive Operational Noise Management Sub Plan. The Sub Plan must address, among other things, details of the type and location of operational noise mitigation measures that are needed to satisfy relevant guidelines and policies, predicted road traffic noise levels after opening of the F3 to Branxton link, and monitoring to verify predicted impacts and compliance with relevant guidelines and policies. Condition of Approval 85 requires the RTA to monitor operational noise and assess the adequacy of noise mitigation measures one year after opening. If noise levels are higher than predicted levels, the RTA must consider additional mitigation.

The proposed design changes would cause similar types of construction and operational noise impacts, in similar locations, as the construction and operation of the Approved Project is likely to cause. The existing Conditions of Approval are comprehensive and would be adequate to manage noise and vibration impacts from construction and operation of the proposed design changes. The changes to operational noise impacts would not be substantial. Effective noise mitigation following the requirements in the RTA *Environmental Noise Management Manual* and the DEC *Environmental Criteria for Road Traffic Noise* could be identified, assessed and validated, as required by Condition of Approval 84.

New safeguards

Other than implementing the Conditions of Approval and Concurrence, no additional safeguards are proposed.

4.7 Aboriginal heritage***Overview***

The Minister's approval for the F3 to Branxton link requires that the RTA prepare an Aboriginal cultural heritage assessment and formulate management plans to minimise impacts on Aboriginal cultural heritage. To fulfil these requirements, the RTA engaged Umwelt (Australia) Pty Ltd (Umwelt) to design and manage an Aboriginal heritage program that addresses the Minister's requirements. The RTA has worked closely with six Aboriginal community groups who have an interest in the management of Aboriginal cultural heritage along the corridor of the F3 to Branxton link.

Umwelt and representatives of the six interested Aboriginal community groups participated in detailed surveys of the F3 to Branxton link corridor between 2004 and 2006. The surveys provided information on Aboriginal sites, potential archaeological deposits (PADs), and sites with cultural heritage value. In total, Umwelt identified 117 sites and potential archaeological deposits (Umwelt (Australia) Pty Ltd 2005):

- 30 isolated finds
- 51 artefact scatters
- 8 grinding groove sites,
- 23 potential archaeological deposits
- 3 stone arrangements
- 2 areas of cultural heritage value.

Aboriginal sites, PADs and areas with cultural heritage value are shown in Appendix 4.

Umwelt obtained approvals from the DEC needed to undertake subsurface investigations and archaeological salvage or artefact collection at Aboriginal sites (Umwelt (Australia) Pty Ltd 2005, Umwelt (Australia) Pty Ltd 2006). The surveys and management recommendations take in the areas surrounding the Sugarloaf realignment, the Kurri Kurri interchange, and from Tuckers Lane to Black Creek, including the connection from the Branxton interchange to the New England Highway.

One of the RTA's main objectives in the management of Aboriginal cultural heritage is to comprehensively investigate and, as the case requires, salvage, collect or conserve all Aboriginal sites and areas with cultural heritage value prior construction. This will avoid the need for representatives of the Aboriginal communities to monitor initial clearing,

when it is difficult to manage safety and potential delays, and reduce the risk of disturbing Aboriginal objects once construction begins.

Impacts

Table 10 summarises changes to impacts on Aboriginal cultural heritage objects and sites.

Table 10 Changes to impacts on Aboriginal Heritage

Design change	Changes to impacts on Aboriginal Heritage from the 12 proposed design changes
Design parameters	No change to impacts.
Median width	Minor change to impacts due to narrowing of the construction footprint.
Newcastle interchange	There are nine Aboriginal heritage sites and PADs within or near the footprint of the Newcastle interchange. When compared to the Approved Project, the proposed design change would affect the Sugarloaf 1 site. The proposed bridges across Minmi Creek would avoid impacts on the Minmi Creek Stone Arrangements 1, 2 and 3 when compared to the Approved Project.
Surveyors Creek realignment	There are ten Aboriginal heritage sites and PADs within or near the footprint of the Surveyors Creek realignment. The proposed design change would affect PAD 4 when compared to the Approved Project. The proposed design change would avoid the Surveyors Creek RTA 9 IF site when compared to the Approved Project.
Buchanan interchange	The proposed design change would not change impacts on Aboriginal heritage sites when compared to the Approved Project.
Averys Lane overpass	The proposed design change would not change impacts on Aboriginal heritage sites when compared to the Approved Project.
McLeod Road overpass	The proposed design change would not change impacts on Aboriginal heritage sites when compared to the Approved Project.
Swamp Creek Bridge	The proposed design change would not change impacts on Aboriginal heritage sites when compared to the Approved Project.
Loxford interchange	The proposed design change would not change impacts on Aboriginal heritage sites when compared to the Approved Project.
Sawyers Gully realignment	There are four Aboriginal heritage sites and PADs within or near the footprint of the Sawyers Gully realignment. The proposed design change would avoid the Sawyers Gully RTA 1 site when compared to the Approved Project.
Allandale interchange	The proposed design change would not change impacts on Aboriginal heritage sites when compared to the Approved Project.
Camp Road underpass	There are five Aboriginal heritage sites within or near the footprint of the Camp Road underpass. The proposed design change would affect the Anvil Creek RTA 25 site. This site could have been affected by the Approved Project, depending on the extent of fill required to raise Camp Road to the level of the bridge over the F3 to Branxton link (see Section 1.5 regarding lack of design detail for the Approved Project).

Umwelt obtained approvals from the DEC needed to undertake subsurface investigations and artefact salvage or collection at all locations that would be affected by the proposed design changes. The RTA proposes to implement recommended management strategies

to conserve or partially conserve, or to minimise impacts on, all Aboriginal sites and areas with cultural heritage value (Umwelt (Australia) Pty Ltd 2006).

Existing environmental requirements

Conditions of Approval 100 to 112 concern cultural heritage management and the RTA must complete six tasks:

1. Coordinate and assist Aboriginal community groups with the preparation of Aboriginal Cultural Heritage Assessments (Conditions of Approval 108, 109).
2. Identify areas to be considered as heritage offsets (Condition of Approval 111).
3. Prepare a detailed research program and undertake a series of test excavations (Conditions of Approval 100, 101).
4. Identify and document management zones for the ongoing management of sites along the F3 to Branxton link corridor (Conditions of Approval 103, 106).
5. Prepare a Cultural Heritage Plan of Management (Conditions of Approval 110, 111).
6. Undertake a salvage program (Condition of Approval 102).

Condition of Approval 112 requires the RTA to notify the DEC of proposed variations to the alignment, design or construction of the Approved Project. This report will be provided to the DEC to satisfy this Condition.

Umwelt has completed Tasks 1 and 3, and has partially completed Tasks 2, 4, 5 and 6. All tasks except part of Task 6 (for the classification of artefacts) must be completed before construction begins.

The existing Conditions of Approval are comprehensive and would adequately manage additional impacts on Aboriginal cultural heritage that would occur if the three elements of the proposed modification were to proceed. The consideration of heritage offsets required in Condition of Approval 111 would be based on the detailed concept design that incorporates the 12 proposed design changes.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.8 European heritage

Descriptions of heritage items

Historic sites

Six historic sites were identified during surveys undertaken between 2004 and 2005 (Umwelt (Australia) Pty Ltd 2003, Umwelt (Australia) Pty Ltd 2004):

- Two brick weirs and the Minmi Creek Stone Wall (a section of a retaining wall) on Minmi Creek at the Newcastle interchange.
- An historic cement footings near Lubmy Lane at Ch 18850.
- An historic post and rail fence southeast of the Allandale interchange at Ch 26000.
- An historic brick and sandstone culvert under the Main Northern Railway Line at Branxton at Ch 35900.

Impacts

The proposed bridges across Minmi Creek would avoid impacts on the two weirs and the stone wall in Minmi Creek when compared to the Approved Project. The proposed design changes would not change the impact of the Approved Project on the historic cement footings near Ch 18850, the historic post and rail fence at Ch 26000 or the historic culvert at Ch 35900. Only the historic cement footings require further assessment to determine their heritage significance.

Existing environmental requirements

Condition of Approval 113 requires the RTA to implement safeguards identified in Section 8.5 of the EIS (Connell Wagner 1995). Section 8.5 discusses protection of the Richmond Vale Railway Tunnel 139, the preparation of a conservation plan for the Greta Camp, the recording of abandoned quarries at Greta and landscaping mitigation at Branxton. Other commitments given in the EIS and the Representations Report (RTA 2001) require the RTA to minimise or avoid impacts during construction or operation on the Richmond Vale Railway formation and tunnels, the Greta Camp, and the quarries at Greta.

The *Heritage Act 1977* requires approval if a relic could be damaged or disturbed. The *Environment Protection & Biodiversity Conservation Act 1999* requires approval if there is likely to be an environmental impact on a matter of national environmental significance, including an impact on a National Heritage place.

The surveys for European heritage sites demonstrate that the 12 proposed design changes would not have an impact on relics protected under the *Heritage Act 1977* or other legislation.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.9 Socioeconomic impacts***Impacts***

Generally, the 12 proposed design changes would not change socio-economic impacts when compared to the Approved Project. The proposed design changes at the Newcastle, Buchanan, Loxford and Allandale interchanges would reduce potential traffic congestion between the F3 to Branxton link and the local road network when compared to the Approved Project. This would provide economic benefits to all road users.

Existing environmental requirements

There are no Conditions of Approval in the Approved Project or commitments made in the Representations Report (RTA 2001) that specifically regulate socioeconomic impacts. The RTA would provide directional and tourist signage for the F3 to Branxton link in accordance with its current signage policies and guidelines.

New safeguards

Other than implementing the Conditions of Approval and Concurrence, no additional safeguards are proposed.

4.10 Land use and property effects***Impacts***

Table 11 summarises changes to impacts on land use and property effects.

Existing environmental requirements

There are no Conditions of Approval that specifically regulate property acquisition or adjustments. Conditions of Approval 30 and 85 require that some plans in the Construction Environmental Management Plan give consideration to property acquisition if certain conditions arise. The Representations Report (RTA 2001) also made commitments to investigate full acquisition of certain properties that are located south of Tuckers Lane.

The RTA must acquire all land needed to accommodate the proposed design changes in accordance with the RTA *Land Acquisition Policy* with compensation determined under the *Land Acquisition (Just Terms Compensation) Act 1991*. A copy of the RTA's policy is presented in Appendix 5.

New safeguards

Other than implementing the Conditions of Approval and Concurrence, no additional safeguards are proposed.

Table 11 Changes to impacts on land use and property

Design change	Changes to impacts on land use and property from the 12 proposed design changes
Design parameters	No change to land use or property impacts.
Median width	The reduction in median width would not affect the width of the road reserve.
Newcastle interchange	The proposed design change is within the existing road reserve of the F3 Freeway and would not alter impacts on land use or change property impacts when compared to the Approved Project.
Surveyors Creek realignment	The proposed design change would avoid the need to acquire land in Lot 126 DP 728961; it would require additional land in Lot 127 DP 728961. The proposed rest area would require additional land in Lot 1 DP 780462 and land in Lot 101 DP 706714, which was not previously affected by the Approved Project. The proposed design change would not alter impacts on land use when compared to the Approved Project.
Buchanan interchange	The proposed design change would not alter impacts on land use or change property impacts when compared to the Approved Project.
Averys Lane overpass	The proposed design change would not alter impacts on land use or change property impacts when compared to the Approved Project.
McLeod Road overpass	The proposed design change would slightly alter the extent of land acquisition, but would not change impacts on land use when compared to the Approved Project.
Swamp Creek Bridge	The proposed design change would not alter impacts on land use or change property impacts when compared to the Approved Project.
Loxford interchange	The proposed design change would not alter impacts on land use or change property impacts when compared to the Approved Project.
Sawyers Gully realignment	The proposed design change would slightly alter the extent of land acquisition on three properties, but would not alter impacts on land use when compared to the Approved Project.
Allandale interchange	The proposed design change would not alter impacts on land use or change property impacts when compared to the Approved Project.
Camp Road underpass	The proposed design change would slightly alter the extent of land acquisition, but would not alter impacts on land use when compared to the Approved Project.

4.11 Air quality

Impacts

The techniques and methods that would be used to construction the concept design for the Approved Project would also be used to construct the detailed concept design. The 12 proposed design changes would not substantially extend the construction period or change the source of dust emissions in areas near dwellings.

The proposed design changes would marginally decrease the total travel distance between the F3 Freeway and Black Creek and therefore reduce total vehicle emissions. The proposed design changes would not substantially change the locations of vehicle emission sources or introduce pollutants in locations that would not have been affected by the concept design for the Approved Project.

Existing environmental requirements

Conditions of Approval 114 and 115 require the RTA to prepare an Air Quality Sub Plan and to ensure that where there is a risk of construction vehicles losing material, that they are maintained and covered to prevent any loss of load or from generating dust. The Air Quality Sub Plan must provide details of all measures that will be used to control dust during construction.

Condition of Approval 129 requires the RTA to ensure that construction compounds and material batching plants are located where they will not cause adverse impacts on, among other things, air quality. Other commitments given in the EIS and the Representations Report (RTA 2001) require the RTA to undertake maintenance of plant and machinery and to monitor air quality during construction to minimise adverse impacts on air quality.

The proposed design changes would cause the same types of impacts, in similar locations, as the construction and operation of the Approved Project is likely to cause. The existing Conditions of Approval are comprehensive and would be adequate to manage impacts on air quality from construction and operation of the proposed design changes.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.12 Traffic and transport**Impacts**

Generally, the 12 proposed design changes would not worsen construction-related impacts on local traffic and access when compared to the concept design in the Approved Project. The proposed design changes at Averys Lane, the Loxford interchange, Sawyers Gully and the Allandale interchange would allow traffic to use existing roads while new structures were built next to them, and would therefore reduce inconvenience to road users.

Newcastle interchange

The proposed design change at the Newcastle interchange would provide a free-flow interchange between the F3 Freeway and the F3 to Branxton link. When compared to the Approved Project, the Newcastle interchange would accommodate greater traffic volumes and provide a longer service life.

Buchanan interchange

The proposed design change at the Buchanan interchange would eliminate a T junction for the movement between John Renshaw Drive westbound and the F3 to Branxton link westbound, which is an important movement for heavy vehicles hauling freight between

the Hunter Valley and the Port of Newcastle. The proposed design change would provide a more compact and conventional interchange than the Approved Project.

Allandale interchange

The proposed design change at the Allandale interchange would provide better access between with the private road leading to the Allandale Quarry and the F3 to Branxton link and Lovedale Road.

Existing environmental requirements

Conditions of Approval 43 to 47 regulate construction-related impacts on local roads and property access. There are no Conditions of Approval that specifically regulate operational traffic.

The proposed design changes would cause the same types of construction impacts as the construction of the Approved Project is likely to cause. The existing Conditions of Approval are comprehensive and would be adequate to manage construction impacts of the proposed design changes on local roads and property access.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.13 Context sensitive design and landscaping

Impacts

The Approved Project will change the visual qualities of the landscapes through which it passes. When compared to the Approved Project, the proposed design changes would alter the features of the Newcastle, Buchanan and Allandale interchanges, and to a lesser extent the Loxford interchange and the Camp Road underpass.

Existing environmental requirements

Commitments in the Representations Report (RTA 2001) require the RTA to design the F3 to Branxton link, and in particularly noise barriers that reduce road traffic noise levels, in a manner that is sympathetic and responds to local environmental features and contexts. The design of the F3 to Branxton link should reduce adverse visual impacts.

Condition of Approval 97 requires the RTA to prepare a detailed Landscape Sub Plan that addresses, among other things, proposed landscaping, plant selection, treatments and finishes of mounds, bunds, and structures, integration of landscaping and soil and water quality management, and lighting.

The RTA has engaged an urban design and landscaping consultant to integrate these requirements into suitable context-sensitive design and landscaping plans for the detailed concept design.

The existing Condition of Approval and commitments in the Representations Report would be adequate to achieve suitable context sensitive design and landscaping outcomes for the three elements of the proposed modification.

4.14 Risks and hazards

Impacts

The techniques and methods that would be used to construction the concept design for the Approved Project would also be used to construct the detailed concept design. The 12 proposed design changes would not substantially change the nature or degree of risks or hazards associated with the construction of a major road project.

Existing environmental requirements

Conditions of Approval 117 to 121 require the RTA to prepare and implement a Hazards and Risk Management Sub Plan. The Sub Plan must identify hazards and risk associated with the F3 to Branxton link, proactive and reactive measures and contingency plans to be used in the event of a pollution incident, and an onsite construction refuelling protocol. Condition of Approval 119 requires the RTA to prepare and implement a Construction Safety Plan to manage hazardous incidents and public safety during construction. Condition of Approval 120 requires the RTA to prepare and implement an Emergency Plan to manage emergency events that may arise during construction or operation of the F3 to Branxton link. Condition of Approval 121 requires the RTA to prepare and implement a Security and Crime Management Strategy to manage public access to, and to minimise the potential for crime near, the F3 to Branxton link corridor.

Other commitments given in the EIS and the Representations Report (RTA 2001) require the RTA to manage construction risks from the storage and use of oils and hazardous liquids, maintenance of plant and machinery, and to provide details of bunded areas for storage of liquids.

The existing Conditions of Approval are comprehensive and would be adequate to manage hazards and risks that could arise from construction and operation of the proposed modification.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.15 Waste management

Impacts

The construction and operation of the concept design for the Approved Project will generate wastes. The proposed design changes would not change the types or volumes of wastes that would be generated during construction or operation of the F3 to Branxton link.

Existing environmental requirements

Condition of Approval 123 requires the RTA to reuse or recycle clean or treated spoil so that the need to import fill is minimised. Condition of Approval 124 requires the RTA to prepare and implement a Waste Management and Reuse Sub Plan. The Sub Plan must identify how wastes will be managed in accordance with the NSW Government's Water Reduction and Purchasing Policy. The Sub Plan must follow a hierarchy of avoid, reduce, reuse, recycle and dispose, and must provide detail on the handling, stockpiling and disposal of wastes.

The existing Conditions of Approval are comprehensive and would be adequate to manage wastes that could be generated during construction and operation of the proposed modification.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.16 Contractor work sites and ancillary infrastructure

Impacts

The proposed design changes would not change the need for contractor work sites (compounds, offices, material storage areas, batch plants) or require that they be located in different areas than those that are likely to be used by a contractor for the concept design.

Road-related ancillary infrastructure (as defined in the Glossary) would need to be provided to allow the construction and operation of the F3 to Branxton link. The proposed design changes would not change the type of road-related ancillary infrastructure needed.

Existing environmental requirements

Condition of Approval 129 requires the RTA to locate batching plants, construction compounds and any other ancillary infrastructure (including sedimentation basins) in locations that satisfy nine criteria.

Other than for the construction of sedimentation basins and installation of boundary fencing that would require clearing of vegetation in endangered ecological communities (see Acacia Environmental Planning 2007b), Condition of Approval 129 is comprehensive and would be adequate to manage impacts of construction work site and ancillary infrastructure needed to construct and operate the proposed modification.

New safeguards

Other than implementing the Conditions of Approval, no additional safeguards are proposed.

4.17 Cumulative effects

Ecological effects

Under strategies that have or will be implemented by the NSW Government and councils in the Lower Hunter Valley, and development proposals at Kurri Kurri, Allandale and North Rothbury/Branxton that the RTA is aware of, native vegetation, including endangered ecological communities, and fauna habitat are likely to be cleared for development. The incremental loss of native vegetation would increase habitat fragmentation and could significantly affect endangered ecological communities and threatened fauna in the region. Developments, and the local and regional road network which supports them, could reduce the ability of fauna to move through remaining habitats in the region. The F3 to Branxton link would contribute to the incremental loss of vegetation and habitat fragmentation in the Lower Hunter Valley.

Socioeconomic effects

Strategic plans being prepared or implemented by the by the NSW Government and councils in the Lower Hunter Valley anticipate substantial population growth during the next 20 to 30 years. The growth in population cannot readily occur without adequate provision of infrastructure and public facilities and services. The F3 to Branxton link will be an important component of the future road-based transportation system in the Lower Hunter Valley. The Australian and NSW governments have long recognised the importance of the F3 to Branxton link:

- It would improve the efficiency of the AusLink National Network between Sydney, Newcastle and Brisbane.
- It would create a high standard road for the Lower Hunter that would relieve congestion on the New England Highway and provide an east-west connection between the Newcastle regional centre and urban centres in the Lower Hunter.
- It would provide a more direct and efficient route for the movement of freight between the Upper Hunter and the Port of Newcastle.

The *Lower Hunter Regional Strategy* (NSW Government 2006) shows that the F3 to Branxton link would assist in the movement of freight from the northwest of NSW and the movement of people to and from the Upper Hunter.

The F3 to Branxton link has induced, and is likely to continue to induce, development that depends on, or is facilitated by, road-based transportation. It may accelerate land value appreciation and speculative development. It is also likely to be a key transportation component in the anticipated growth in the development of mineral and extractive resources in the Hunter Valley.

Physical effects

The F3 to Branxton link would have little impact on the use or conservation of natural resources such as groundwater, surface water or air.

The visual qualities of the Lower Hunter Valley will change with anticipated population growth and development. The F3 to Branxton link would contribute to the change in the visual qualities of the landscape in which it is located.

5

Environmental safeguards and legislative requirements

5.1 Environmental safeguards

The proposed design changes would have a variety of environmental impacts that would be similar to those of the Approved Project. The Conditions of Approval and Concurrence that apply to the Approved Project would apply to the proposed design changes. They are comprehensive and would be adequate to manage the change in the location, magnitude and extent of potential adverse environmental impacts that could be caused by constructing and operating the F3 to Branxton link, as changed by the proposed design changes.

Other than implementing the Conditions of Approval, the RTA does not propose new commitments to safeguard the environment.

5.2 Approval, licence and permit requirements

Under transitional arrangements in Item 88 of Schedule 6 of the EP&A Act, Sections 75U and 75V of this Act do not apply to an activity previously approved by the Minister that is now a project approval under Part 3A.

The F3 to Branxton link is a *freeway* in Schedule 1 of the *Protection of the Environment Operations Act 1997* and is therefore a scheduled activity (premises-based). The RTA would require an Environment Protection Licence under Section 48 of this Act to construct a scheduled activity (premises-based).

The F3 to Branxton link would require excavation and/or filling in or near watercourses. The RTA must notify the Department of Primary Industries (DPI) of its intention to dredge and/or reclaim water land under Section 199 of the *Fisheries Management Act 1994*. To comply with Section 219 of this Act, the RTA must also ensure that drainage structures and bridges do not block fish passage in waterways.

5.3 Statutory planning instruments

Under Section 75R of the EP&A Act, Parts 4 and 5 of this Act, and environmental planning instruments (other than State Environmental Planning Policies), do not apply to or in respect of an approved project.

There are no State Environmental Planning Policies that would apply to or regulate the construction or operation of the F3 to Branxton link, as changed by the proposed design changes.

5.4 Legislative requirements

Table 12 shows NSW legislative requirements that apply, or may apply, to the construction and operation of the F3 to Branxton link, as altered by the proposed design changes.

Table 12 NSW legislative requirements

Act	Approval, licence, permit or authority that may be required
<i>Contaminated Land Management Act 1997</i>	If contaminated land that presents “a significant risk of harm” is present, the RTA must notify the DEC.
<i>Environmentally Hazardous Chemicals Act 1985</i>	Requires a licence for activities involving chemicals or chemical wastes under a Chemical Control Order (dioxin or PCB wastes)
<i>Fisheries Management Act 1994</i>	The RTA must notify the Department of Primary Industries (NSW Fisheries) of its intention to undertake dredging or reclamation. The RTA must also ensure that it does not block fish passage when undertaking construction in watercourses.
<i>Heritage Act 1977</i>	If relics are disturbed or excavated, work must stop in the vicinity of the discovery so that further disturbance is prevented. The RTA would determine whether an excavation permit under Section 140 of the Heritage Act 1977 would be required before work continues.
<i>National Parks and Wildlife Act 1974</i>	If Aboriginal artefacts are discovered, work must stop in the vicinity of the discovery so that further disturbance is prevented. The RTA would notify the DEC and the relevant Aboriginal community groups and follow their requirements.
<i>Native Vegetation Act 2003</i>	The Native Vegetation Act 2003 generally requires consent for clearing native vegetation. An exemption in Clause 25(g) of this Act removes the need to obtain development consent for any clearing that is part of a Part 5 activity.
<i>Occupational Health and Safety Act 2000</i>	Keeping, selling, disposal, manufacturing, preparing for use, packing or using dangerous goods or explosives is regulated under Section 135A.
<i>Protection of the Environment Operations Act 1997</i>	The F3 to Branxton link meets the definition of a <i>freeway</i> in Schedule 1 of this Act and is therefore a scheduled activity (premises-based). The RTA would require an Environment Protection Licence under Section 48 of this Act to construct a scheduled activity (premises-based).
<i>Rivers and Foreshore Improvements Act 1948</i>	A permit under Part 3A of this Act is required to excavate or disturb land within 40 m of the bank of a waterway. Under Section 22H, the RTA is exempt from the need to obtain the permit, but must notify the Department of Natural Resources before such work is undertaken.
<i>Rural Fires Act 1977</i>	May require an approval for open burning from the local council or the Rural Fire Service.
<i>Threatened Species Conservation Act 1995</i> <i>Fisheries Management Act 1994</i>	If threatened species are discovered during construction, work must stop in the vicinity of the discovery so that further disturbance is prevented. The RTA would notify the DEC and follow their requirements.

5.5 Environment Protection & Biodiversity Conservation Act

Under the Commonwealth *Environment Protection & Biodiversity Conservation Act 1999* (the EPBC Act), a proponent requires the approval of the Minister for the Environment to undertake an action that could have a significant impact on matters of national environmental significance (NES). There are seven NES matters that must be considered under this Act

The detailed concept design as a whole would have an impact on *Eucalyptus parramattensis* ssp. *decadens* and *Grevillea parviflora* ssp. *parviflora*, both of which are listed as vulnerable under this Act. One element of the proposed modification (Acacia Environmental Planning 2007b) would have an impact on *Tetratheca juncea*, listed as vulnerable under this Act. The RTA may need to refer the proposed design changes to the Australian Government Department of the Environment and Heritage (Harrington, et al 2007).

Table 13 shows the seven matters of national environmental significance and the likely impact from the proposed changes.

Table 13 NES matters

Matter	Impact
World Heritage property	No impact. There are no World Heritage properties near the proposed modification or the F3 to Branxton link.
National Heritage place	No impact. There are no National Heritage places near the proposed modification.
Wetlands of international importance (Ramsar wetlands)	No impact. There are no wetlands of international importance near the proposed modification. The nearest Ramsar wetlands are the Hunter Estuary Wetlands (comprising the Kooragang Nature Reserve and the Shortland Wetlands), at least five kilometres northeast of the F3 to Branxton link and Newcastle interchange,
Commonwealth listed threatened species, migratory species or ecological communities	The detailed concept design, as a whole, would have an impact on <i>Eucalyptus parramattensis</i> ssp. <i>decadens</i> and <i>Grevillea parviflora</i> ssp. <i>parviflora</i> . One element of the proposed modification could have an impact on <i>Tetratheca juncea</i> . No impact on other threatened species, migratory species, or ecological communities.
Nuclear action	No impact. The proposed change does not constitute a nuclear action.
Commonwealth marine area	No impact. The proposed change would not affect Commonwealth marine areas.
Direct or indirect impact on Commonwealth land	No impact. The proposed change would not affect Commonwealth land.

6 Justification

6.1 Benefits

The proposed design changes would reduce clearing of native vegetation and threatened species habitat in several locations along the F3 to Branxton link. The proposed design changes would reduce impacts on Aboriginal heritage sites when compared to the Approved Project.

The proposed design changes would improve traffic safety and network performance at the Newcastle, Buchanan and Allandale interchanges and would be likely to attract more traffic from the local road network. Consequently, it would increase the road user economic benefits of the F3 to Branxton link and reduce traffic volumes on the local road network.

The proposed modification would reduce the need for traffic, and in particular heavy vehicles, to circulate in Branxton. It would therefore improve residential and business amenity, reduce road traffic noise and vehicle pollution, and improve pedestrian safety in Branxton.

6.2 Adverse impacts

The recognition of road-related ancillary infrastructure would increase total clearing of native vegetation from 168 ha to 182 ha. Clearing for sedimentation basins and boundary fencing would increase clearing of native vegetation by 25 ha and endangered ecological communities by 21 ha. The RTA has minimised the clearing needed for road-related ancillary infrastructure as far as practical.

6.3 Conclusion

The proposed design changes are justified because they would reduce ecological impacts and improve the transport effectiveness of the F3 to Branxton link. Adverse impacts could be effectively managed by implementing the Conditions of Approval and Concurrence.

7 References

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- NSW Government 2006. *Lower Hunter Regional Strategy*. Department of Planning, Sydney.

Roads and Traffic Authority 2001. *Representations Report Proposed Highway Link F3 Freeway to Branxton*. Report in three volumes prepared by RTA Operations dated October 2001.

Umwelt (Australia) Pty Ltd 2003. *Proposed National Highway Link F3 Freeway to Branxton Project No. 60052 Additional Aboriginal Heritage Assessment*. Report dated September 2003.

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Umwelt (Australia) Pty Ltd 2005. *Review of Archaeological Constraints and Management Recommendations for the Branxton interchange – Proposed National Highway Link F3 to Branxton*. Draft report dated May 2005.

Umwelt (Australia) Pty Ltd 2006. *Proposed National Highway Link F3 to Branxton – Stage 3 Research Design and Methodology to Accompany a DEC Section 90 Consent Application*. Draft report dated March 2006.

Glossary

2001 mapping	Vegetation mapping used in 2001 to estimate vegetation clearing polygons for the concept design. The clearing limits in Conditions of Approval 60 and 61 in the Minister's approval are based on this mapping.
2005 mapping	Vegetation mapping prepared by Biosis Research. It is based on the LHCCREMS vegetation mapping. The mapping has been refined to incorporate data from ground-truthing along the F3 to Branxton link and vegetation community boundaries from 2003/2004 high resolution aerial photography.
Approved Project	The activity approved by the then Minister for Urban Affairs and Planning in November 2001. It is based on the concept design. Since 1 August 2005, the F3 to Branxton link is a project approved under Part 3A of the EP&A Act. At the request of the RTA, the Minister modified the approval on 31 July 2006 to permit staged construction (but not opening).
Ch	Chainage
Chainage	The measured distance in metres along the F3 to Branxton link from a starting point at the Newcastle interchange and ending at Branxton. Chainage numbers increase from east to west. Negative chainages refer to the section of the F3 to Branxton link that is east of the F3 Freeway.
Concept design	The conceptual road design on which the EIS, FIS and assessments in the Representations Report were based. The concept design does not include road-related ancillary infrastructure.
DEC	Department of Environment and Conservation (previously the NSW EPA and the NPWS)
Detailed concept design	The detailed conceptual road design that refines the concept design and incorporates 15 proposed design changes and road-related ancillary infrastructure.
EIS	Environmental Impact Statement prepared by Connell Wagner in 1995
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EPA	NSW Environment Protection Authority
EPBC Act	<i>Environment Protection & Biodiversity Conservation Act 1999</i>
F3 to Branxton link	The Approved Project.
FIS	Fauna Impact Statement prepared by Connell Wagner in 1997
LHCCREMS	Lower Hunter and Central Coast Regional Environmental Management Strategy
LHCCREMS vegetation mapping	Vegetation mapping of the Hunter region catchment compiled for the Lower Hunter and Central Coast Regional Environmental Management Strategy.
Link	F3 to Branxton link
NPWS	National Parks and Wildlife Service
PAD	Potential Archaeological Deposit
Proposed design changes	The proposed changes to the road design of the Approved Project. There are 12 elements: design parameters, median width, the Newcastle interchange, the Surveyors Creek realignment, the Buchanan interchange, Averys Lane overpass, McLeod Road overpass, South Maitland Railway and Swamp Creek, the Loxford interchange, the Sawyers Gully realignment, the Allandale interchange, and Camp Road underpass. The RTA has determined that these changes are consistent with the Minister's Approval.
Proposed modification	The proposed modification has five elements: the Sugarloaf realignment, the Kurri Kurri interchange, Tuckers Lane to Black Creek, water quality controls in locations with high conservation significance for flora, and the exceedance of the clearing limit in Condition of Approval 60. The RTA has determined that these changes are inconsistent with the Minister's Approval.

Road-related ancillary infrastructure	Infrastructure needed to construct and operate the F3 to Branxton link. It includes boundary and fauna exclusion fencing, water quality controls, construction and maintenance access within the road corridor, and a constructability margin. Condition of Concurrence 4 requires the RTA to assess the impacts of clearing for road-related ancillary infrastructure.
Skyline Ridge	The cut in a ridge centred at Ch 3700.
TSC Act	<i>Threatened Species Conservation Act 1995</i>