

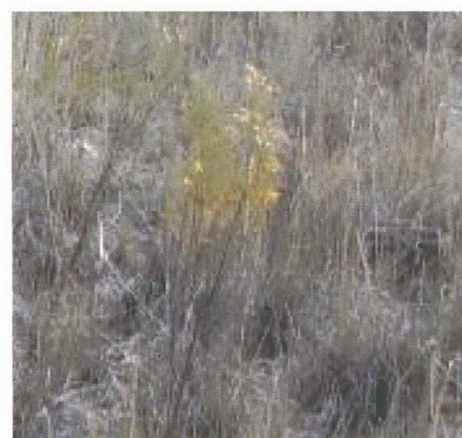
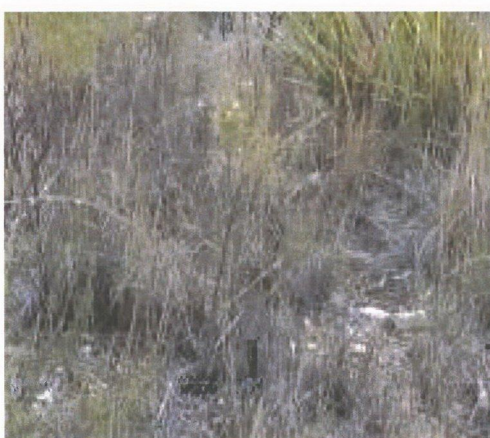
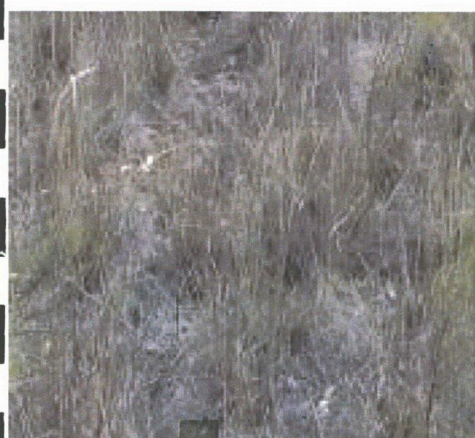
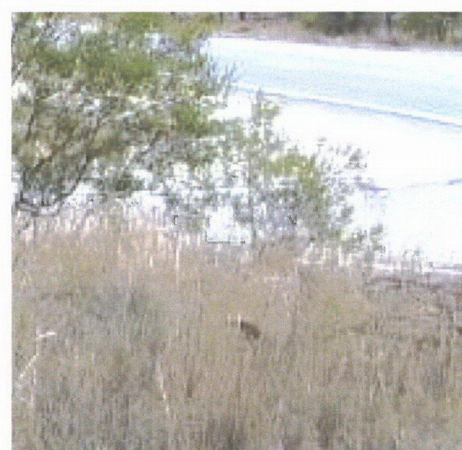
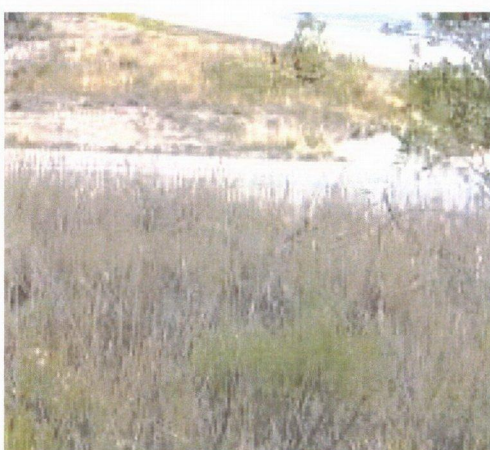
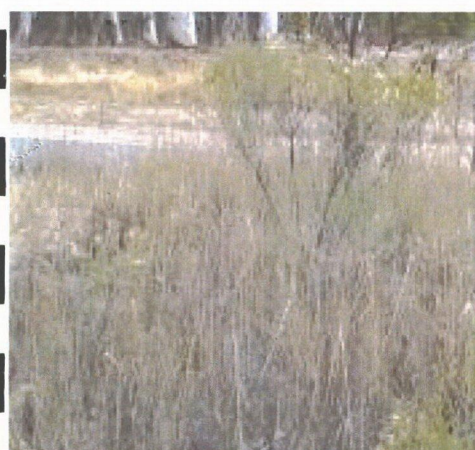
Hume Highway Realignment Northbound Carriageway at Tiycles Lane 12km east of Goulburn

Review of Environmental Factors

RTA ENVIRONMENTAL TECHNOLOGY BRANCH

JANUARY 2005

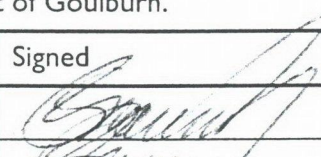
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Document Controls

Business Unit	Environmental Technology Branch		
Project No.	H/44127/A		
Document description	REF: Hume Highway Realignment, Northbound Carriageway at Tiyces Lane, 12km east of Goulburn.		
	Name	Signed	Date
Approving Manager	Lisa Brown		13-1-2005
Reviewing Officer	Simone Garwood		13-1-2005

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Location	File
G:\Ops\Environ\Assessments_Section\Projects\0405\Hume Hwy, Tiyces Lane\REF\final REF Hume Hwy,Tiyces Lane 24-12-04.doc	4M3840

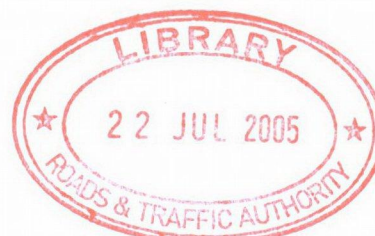
Document Status	Date
Final	13-1-2005

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I Introduction and Methodology

1.1 Name of Proposed Activity

Hume Highway Realignment Northbound Carriageway at Tiyces Lane, 12km east of Goulburn.

1.2 Local Government Area

Goulburn Mulwaree Council.

1.3 RTA Region

Southern Region.

1.4 Introduction

The NSW Roads and Traffic Authority (RTA) proposes to carry out realignment of the northbound carriageway of the Hume Highway at Tiyces Lane, 12km east of Goulburn.

This Proforma 2 Review of Environmental Factors (REF) has been prepared by Environmental Technology Branch (RTA Operations Directorate) on behalf of RTA Southern Region.

For the purposes of these works, the RTA is the proponent and the determining authority under Part 5 of the *Environmental Planning and Assessment (EP&A) Act 1979*.

The purpose of the REF is to describe the Proposal, to document the likely impacts of the Proposal on the environment, and to detail protective measures to be implemented.

The description of the proposed works and the associated environmental impacts have been undertaken in the context of Clause 228 of the *Environment Planning and Assessment Regulation 2000*, the *Threatened Species Conservation (TSC) Act 1995*, the *Fisheries Management (FM) Act 1994*, and the (Commonwealth) *Environment Protection and Biodiversity Conservation (EPBC) Act 1999*. In doing so, the REF helps fulfil the requirements of Section 111 of the EP&A Act, that the RTA examine and take into account to the fullest extent possible, all matters affecting or likely to affect the environment by reason of the activity.

This REF has been prepared in accordance with the RTA's Proforma 2 REF as presented in the RTA's *Environmental Impact Assessment Policy, Guidelines and Procedures, Version 4 2001*.

The findings of the REF would be considered when assessing:

- Whether the Proposal is likely to have a significant impact on the environment and therefore the necessity for an Environmental Impact Statement (EIS) under Section 112 of the EP&A Act.
- The significance of any impact on threatened species as defined by the TSC Act, in Section 5A of the EP&A Act and therefore the requirement for a Species Impact Statement (SIS).
- The potential for the Proposal to significantly impact a matter of national environmental significance or Commonwealth land and the need to make a referral to the Commonwealth Environment Minister in accordance with the EPBC Act.

1.5 Background

The Hume Highway links Australia's two largest cities, Sydney and Melbourne. It is a major interstate corridor, carrying road freight worth about \$20 billion annually. Approximately 10 million people use the Highway every year. The Highway also is an important link to regional freight networks. Most of the Hume Highway, including all of the 294km in Victoria, is built as a four-lane divided highway (DoTARS 2004).

Daily traffic levels vary considerably, from around 80,000 vehicles per day (vpd) near "The Crossroads", south of Sydney, to a low of about 4700 vpd between Tarcutta and Holbrook in southern New South Wales, before rising again around Albury. Traffic levels on the Hume Highway in Victoria average 20,000 vpd, with 66,000 vpd north of Melbourne. Commercial and heavy transport vehicles comprise between 16 to 40 percent of the traffic stream, depending on the location (DoTARS 2004).

The Hume Highway northbound carriageway at Tiyces Lane has a substandard vertical and horizontal alignment, with three tight curves over undulating terrain. The crash history for the northbound carriageway is poor. Vehicles turning right into Tiyces Lane from the Hume Highway have a restricted sight distance. Vehicles turning left from a quarry onto the Hume Highway also have restricted sight distances.

The Tiyces Lane/Hume Highway intersection is located within the central section of the Proposal site, and quarry access roads are located within the eastern section of the Proposal site.

The RTA's Southern Region wrote to the Goulburn Mulwaree Council on 22 July 2004, advising them of the proposed works at Tiyces Lane. No consultation with the local community has been undertaken at the time of writing the REF.

Hume Highway improvements to junctions at Towrang and Carrick Roads (approximately 800m west of the proposed realignment works) are planned to be constructed in 2005/2006.

1.6 Methodology

The method in which this document has been prepared is as follows:

1. A discussion was held with the Project Manager to consider the Proposal.
2. RTA representatives undertook a site visit on 18 August 2004 with the Project Manager to provide an overview of the Proposal and discuss any issues relevant to the completion of the REF.
3. Consultation was undertaken with the following agencies and RTA personnel:
 - Department of Infrastructure Planning and Natural Resources (DIPNR);
 - Department of Environment and Conservation (DEC);
 - Sydney Catchment Authority (SCA);
 - Pejar Local Aboriginal Land Council (LALC);
 - RTA Regional Environmental Adviser, Southern Region; and
 - RTA Aboriginal Programs Consultant, Southern Region.
4. A search was conducted on the following databases to identify any potential issues:
 - Australian Heritage Database;
 - NSW Heritage Office State Heritage Register and State Heritage Inventory;

- RTA Heritage and Conservation Register (s.170);
 - Local Council Heritage Lists (LEP);
 - National Native Title Claims Search;
 - DEC Aboriginal Heritage Information Management System (AHIMS);
 - DEC Wildlife Atlas threatened flora and fauna records; and
 - The Commonwealth Department of the Environment and Heritage (EPBC Act) Protected Matters Databases.
5. As part of the environmental assessment undertaken for this REF, an ecological assessment specialist study was undertaken to identify Proposal constraints and to provide site specific safeguards. Details and findings from the ecological assessment are further discussed in this REF and a copy of the specialist study is included as **Appendix A** to this REF.
6. A literature review was undertaken to determine issues relating to:
- Landform, geology and soils;
 - Local Environmental Plan;
 - State Environmental Planning Policies;
 - Regional Environmental Plans;
 - Groundwater;
 - Salinity;
 - Council's State of Environment Report; and
 - Catchment Blue Prints (Warragamba Catchment Blueprint 2002).

2 Proposal Description

2.1 Location

The Proposal is located on the Hume Highway, approximately 12km east of Goulburn (refer to Figure 2.1). The Proposal, which includes realigning the northbound carriageway of the Hume Highway, extends for a distance of approximately 2.5km along the Highway. The Tiyces Lane/Hume Highway intersection is positioned approximately in the centre of the Proposal site (refer to Figure 2.2).

The Proposal is located within the Goulburn Mulwaree LGA. The Goulburn Mulwaree LGA is a recent amalgamation of the Goulburn and Mulwaree Councils. Prior to the amalgamation of the two Councils, the Proposal site would have been located within the Mulwaree Shire.

2.2 General Description of Proposal Site and Study Area

The Proposal is located on the Hume Highway, approximately 12km east of Goulburn. The 'Proposal site' is defined as the area of land in which all construction works would be undertaken, and the land on which the compound and stockpile sites would be situated (refer to Figure 2.2). The 'study area' includes the Proposal site and land approximately 50m to the north, south, east and west of the Proposal site. Refer to **Appendix B** for photographs of the study area and to **Appendix C** for the concept design.

The existing Highway within the Proposal site consists of a four-lane divided carriageway with a vegetated median of variable width (15m to 75m). Vehicle access at Tiyces Lane/Hume Highway and the quarry/Hume Highway intersections is permitted in all directions. Safety barriers are only present on the southbound carriageway.

The AADT on the Hume Highway at the nearest location to the Proposal site (ie. Marulan) is approximately 28,000 for the year 2003. Heavy vehicles make up approximately 20-25% of all traffic movements.

The nearest residence to the Proposal site is located approximately 430m south of the Hume Highway adjacent to Tiyces Lane. Another residence is located approximately 500m south east of the eastern end of the Proposal site. A quarry is located adjacent to the north eastern section of the Proposal site. An informal heavy vehicle rest area is also located to the immediate east of the quarry access location. Other land uses surrounding the Proposal site include environmental protection (north west of Proposal site) and rural (all other areas adjacent to the Proposal site).

The majority of land adjacent to the southern side of the Proposal site has been subject to vegetation clearing for road and rural purposes. Land adjacent to the northern side of the Proposal site has been subject to vegetation clearing for road, rural and quarry purposes (ie. gravel extraction). Remnant vegetation adjacent to the Proposal site ranges from dense to scattered native bushland. The remnant bushland vegetation within the median is generally moderate in density, with some grass sections.

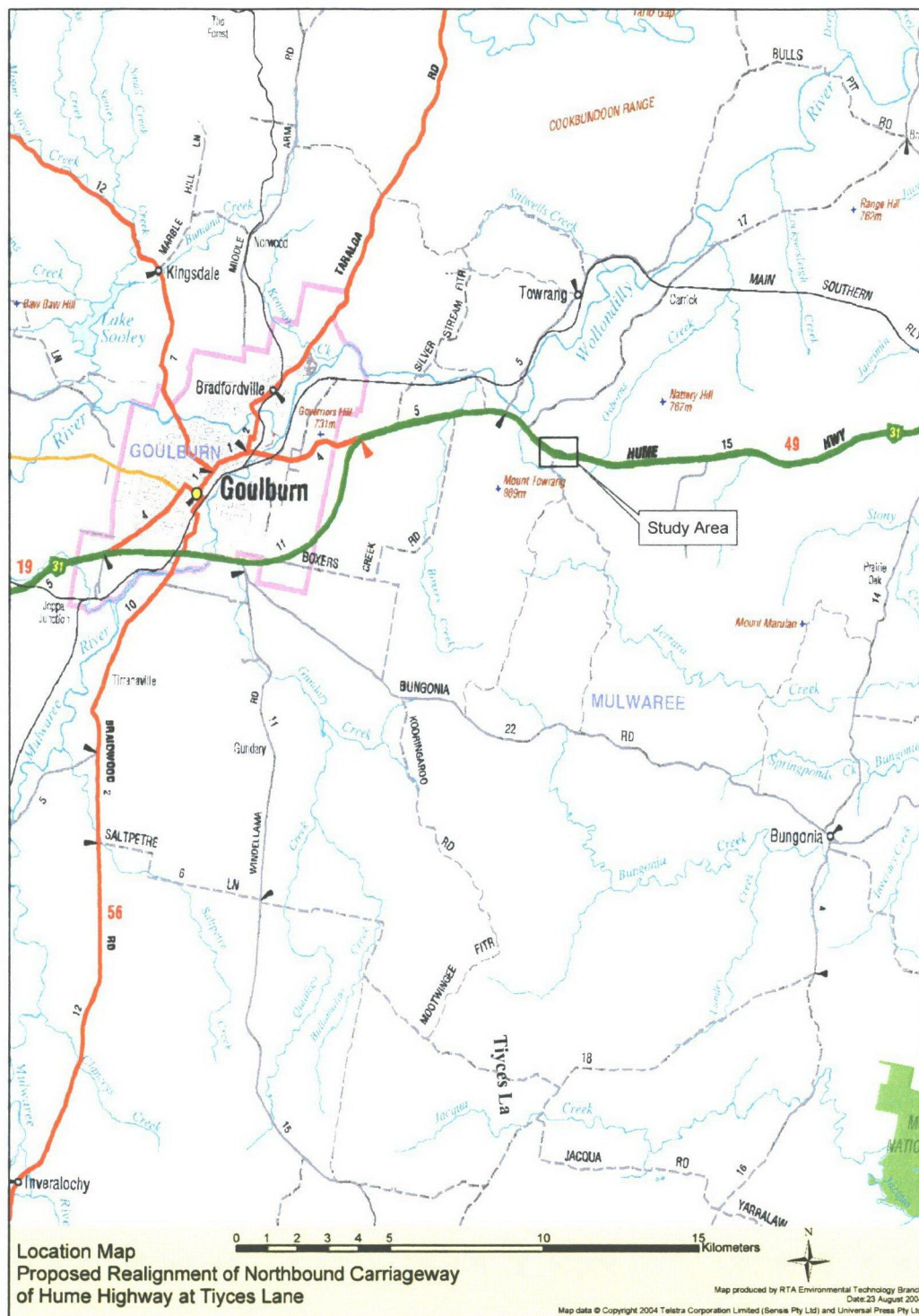


Figure 2.1: Locality map

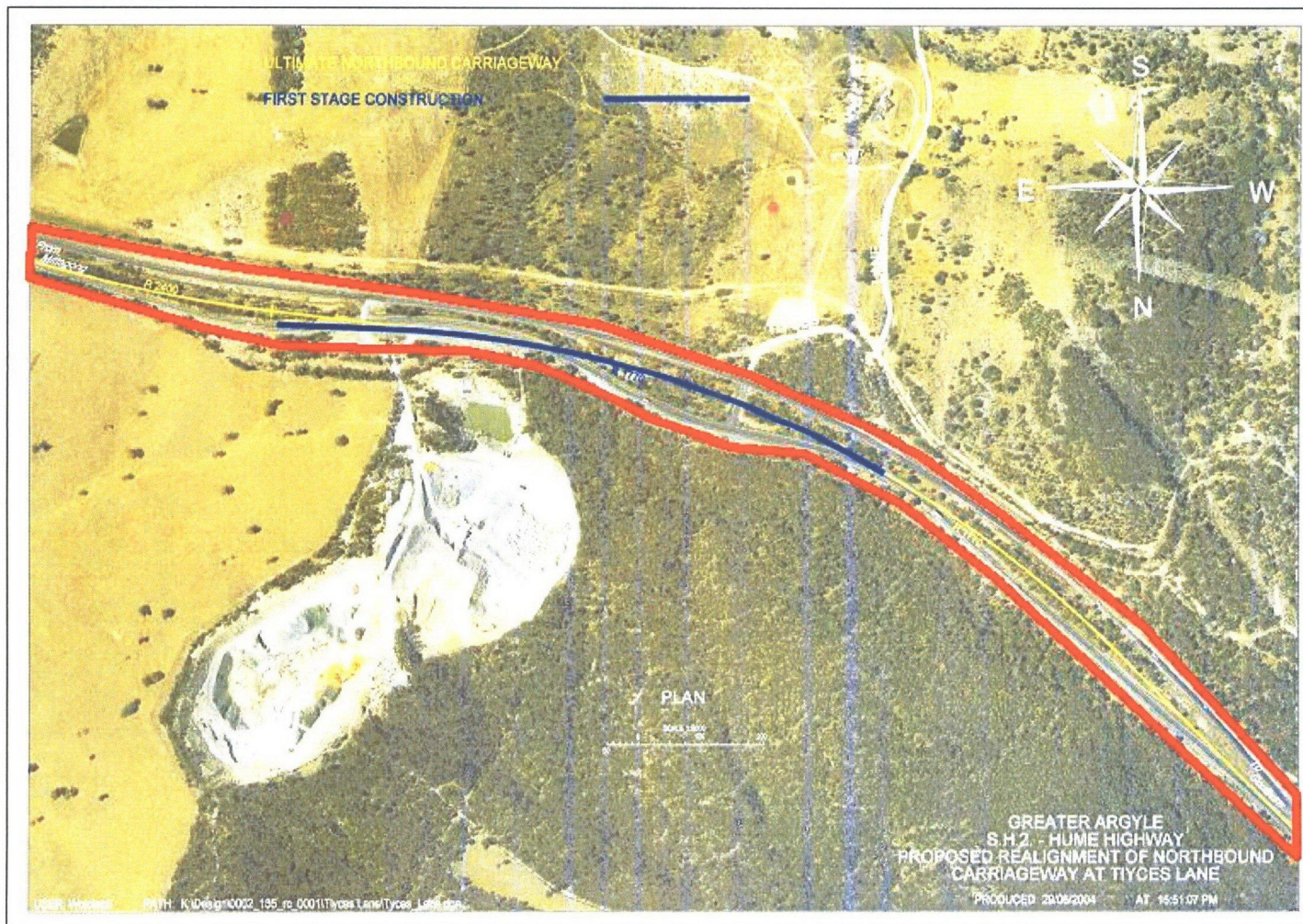


Figure 2.2: Proposal Site

Source: Aerial photography courtesy of Land and Property Information NSW

The eastern end of the Proposal site consists only of narrow strips of woodland and single rows of trees, which are fragmented by the existing Hume Highway and access tracks. These areas are surrounded to the north, south and east by cleared open pastures, and are of little value for any but the most mobile and disturbance-tolerant of native fauna. The whole of the Proposal site is considerably affected by noise and other disturbances associated with the existing Hume Highway. Only the more disturbance-tolerant fauna species would be expected to occur within the Proposal site. Most native fauna would prefer the extensive areas of native vegetation, which are located to the south and particularly to the north of the Proposal site. The Hume Highway currently provides a barrier to fauna movements. No regular tracks were observed leading to the Highway, nor marks on trees. Some small tree-hollows, which provide potential shelter and nesting opportunities for microchiropteran bats and small hollow-dwelling birds are present within the Proposal site. There are no culverts of value to fauna within the Proposal site. No creeklines pass under the Highway within the Proposal site (RTA 2004a).

The topography of the Proposal site and adjoining areas ranges from low to moderate slopes. No creeklines are present within the Proposal site. Stormwater runoff from the Highway enters unnamed ephemeral drainage lines on the northern side of the Proposal site, which connect to Towrang Creek approximately 1km north west of the Proposal site (western section).

2.3 Description of the Proposal

2.3.1 General Description of the Proposal

The Proposal would involve realigning the Hume Highway northbound carriageway for a length of 2.5km in the vicinity of Tiyces Lane. The new northbound carriageway would generally parallel the alignment of the southbound carriageway. Two northbound traffic lanes (plus turning lanes) and a vegetated median (approximately 20m width) would be provided by the Proposal.

The Proposal would improve the existing vertical and horizontal alignment and sight distances of the Hume Highway northbound carriageway within the Proposal site. Road safety would accordingly improve upon opening of the new road alignment.

Operational access to Tiyces Lane from the Hume Highway would be maintained in its current location. Northbound and southbound operational access at Tiyces Lane would be maintained, and a northbound turning lane into Tiyces Lane would be provided. Access to the quarry from the Hume Highway would be moved approximately 40m to the west of its current location. Northbound and southbound quarry access would be maintained. Northbound turning lanes to the east and west of the quarry would be provided.

Traffic would use the existing road during construction. A temporary side track would be provided for northbound traffic during the construction period between chainage 146500 to 146800. The realigned Hume Highway would comprise two 3.5m lanes, a 1m shoulder (right hand side) and a 3m shoulder (left hand side). The design speed would be 110km/hr.

Compound/stockpile sites are expected to be located within the road reserve within the Proposal site.

No on-site concrete batch plant would be used for the Proposal. 1060m³ (asphaltic concrete) of concrete would be batched off-site at an existing batch plant in Goulburn, and delivered in agitator trucks. Concrete (450 m³ for precast kerbs and berms/headwalls) would be batched off-site at an existing batch plant in Goulburn, and precast items delivered to site.

Both cut and fill sections would be required to construct the new road alignment. The Proposal would alter the existing landform by constructing cut and fill embankments along

the new road alignment. A fill embankment approximately 150m west of the proposed new quarry access (chainage 146580 to 146780) would be up to 5m high and 20m wide on the northern side of the new carriageway. The majority of the fill embankments would be less than 2m high and less than 10m wide on the northern and southern sides of the new carriageway. A cut embankment toward the western end of the Proposal site (chainage 147260 to 147500) would have cut walls up to 5m high and 10m wide on the southern side of the new carriageway. The other cut embankments would have walls less than 5m high and the cut width would vary from 2m to 10m on the northern and southern sides of the new carriageway (Refer to **Appendix C**). A clear zone of 11m would be applied within fill sections, and a 7.5m clear zone would apply within cut sections. Where clear zone requirements cannot be practically achieved, road safety barriers would be provided. Road safety barriers would be provided along the edge of new northbound carriageway on fill sections, and in the median at median crossovers.

Roadside drainage structures (ie. earth drains, pits, culverts) would be constructed along the new road alignment. All signage and road markers would be in accordance with current RTA requirements.

Obsolete drainage structures at chainages 146507, 146950, 147020, 147500 and 147520 would be removed, and the disturbed ground would be reformed to match the surrounding landform. Obsolete sections of the existing Highway road pavement would be ripped, reshaped and rehabilitated with native plants.

No property acquisition would be required for the Proposal, and no blasting would be undertaken as part of the Proposal.

2.3.2 Proposal Cost and Source of Funds

The Proposal would cost approximately \$7M and funding allocation would be sourced from the Federal Government.

2.3.3 Timing

It is anticipated that Stage 1 of the Proposal would be completed approximately 6 months after commencing in January 2005 given ideal working conditions. The remaining sections of the Proposal would be completed by mid 2010.

3 Statutory Position

3.1 Local Environmental Plan

Development on land within the Goulburn Mulwaree Local Government Area (LGA) is controlled by Goulburn Mulwaree Council under the *Mulwaree Local Environmental Plan (LEP) 1995* (Note: Goulburn Mulwaree Council does not have its own LEP yet). The Proposal site is located with Zone No 1 (a) (General Rural). The Proposal is not prohibited within Zone No 1(a).

Adjoining land zones are Zone No 7 (b) (Environmental Protection) to the north west and Zone No 1 (b) (Rural—Urban Investigation) to the south west of the Proposal site respectively. The Proposal is not prohibited within Zones 1(b) or 7(b). The Proposal would not affect any conservation areas or heritage items identified in the Mulwaree LEP.

Roadwork activities within Zone 1(a) of the Mulwaree LEP would be permissible with development consent from the Goulburn Mulwaree Council. However, SEPP 4 applies to this Proposal as the works are for the purposes of a classified road, and the requirement for consent is thereby removed. For further information regarding SEPP 4, please refer to Section 3.3 of this REF.

3.2 Regional Environmental Plans

No regional environmental plans apply to the Proposal site.

3.3 State Environmental Planning Policies

SEPP 4 - Development without Consent and Miscellaneous Complying Development

Clause 11C(1) states:

"If, in the absence of this clause, development for the purposes of a classified road or proposed classified road may be carried out only with development consent, that development may be carried out without that consent".

SEPP No. 4 applies to the Proposal, as the proposed works are for the purposes of a classified road as defined by the *Roads Act 1993*. Therefore the RTA would not require consent from Goulburn Mulwaree Council prior to undertaking the proposed works. This activity has therefore been assessed under Part 5 of the EP&A Act.

SEPP 44 – Koala Habitat Protection

The Goulburn Mulwaree Council (previously Mulwaree Council) is identified within the Schedules of SEPP 44 (Koala Habitat Protection) as a Local Government Area in which Koalas are known to occur. While the requirements of the SEPP do not technically apply to this Proposal, as it is not subject to Council consent, it is the RTA's practice to consider SEPP 44 criteria in its EIA process. These criteria relate to the percentages of feed tree cover, particularly trees listed under Schedule 2 - Known Feed Trees. The assessment criteria consider the percentage cover of known feed trees, and whether these are greater or less than 15% of the total tree canopy.

No tree species listed under Schedule 2 of the Policy were recorded within the Proposal site. Therefore the Proposal site does not support 'potential koala habitat'. SEPP 44 does not apply to the proposed works.

State Environmental Planning Policy No. 58 - Protecting Sydney's Water Supply

"Road works" as defined by the *Roads Act 1993*, that are proposed within the hydrological catchment, require development consent from the relevant local Council. The exception to that general requirement is "maintenance and repair" of road works (Note: maintenance and repair are terms not defined by SEPP 58).

The RTA Legal Branch advised in October 2004 that changes to horizontal and vertical alignments which are confined predominantly within the existing road reserve (ie. this Proposal), would not require local Council consent under SEPP 58.

With regard to Clause 10 matters under SEPP 58:

- The Proposal is expected to have a neutral effect on the water quality of the Wollondilly River hydrological catchment;
- Water quality management practices proposed to be carried out as part of the Proposal are expected to be sustainable over the long term; and
- The Proposal is expected to be compatible with environmental objectives and water quality standards for the Wollondilly River hydrological catchment¹ (SCA 2004).

Impacts on water quality within the Wollondilly River and/or Lake Burragorang would not be expected, providing safeguards specified in Section 10.1 of this REF are implemented.

The "*Sustaining the Catchments Regional Environmental Plan (REP)*" is due for release in early 2005. This REP is anticipated to remove the requirement for development consent from local Council for works not considered to be "maintenance and repair" under SEPP 58.

3.4 Confirmation of Part 5 Position

All relevant statutory planning instruments have been examined for the Proposal. It is confirmed that this Proposal is subject to environmental impact assessment under Part 5 of the EP&A Act 1979.

3.5 Licences and Approvals

Native Vegetation Conservation Act 1997

All vegetation to be removed by the Proposal would be located within the designated road corridor or land acquired for the purpose of road construction. Approval from DIPNR to clear vegetation within the road corridor would therefore not be required.

Protection of the Environment Operations Act 1997 (POEO Act)

Concrete works

No on-site concrete batch plant would be used for the Proposal. 1060m³ (asphaltic concrete) of concrete would be batched off-site at an existing batch plant in Goulburn, and delivered in agitator trucks. Concrete (450 m³ for precast kerbs and berms/headwalls) would be batched off-site at an existing batch plant in Goulburn, and precast items delivered to site.

¹ a. Clean, healthy, productive surface and groundwater

b. Productive and protective vegetation and soil achieving an ecological balance

c. A stable and aesthetically pleasing landscape that sustains social and economic land management

d. An aware and responsible community whose actions sustain and improve the quality of life in the catchment

The Proposal would not produce any pre-mixed concrete or concrete products within the Proposal site, that have a production capacity of more than 30,000 tonnes per year of concrete or concrete products. Under Schedule 1 '*Schedule of EPA-licensed activities*' of the POEO Act, a licence from DEC would not be required.

All concrete works would be undertaken in accordance with the EPA *Environmental Best Management Practice Guideline for Concreting Contractors 2002*.

Fill extraction

Under Schedule 1 '*Schedule of EPA-licensed activities*' of the POEO Act, extractive industries are defined as activities:

- that obtain extractive materials by methods including excavating, dredging, blasting, tunnelling or quarrying or that store, stockpile or process extractive materials, and
- that obtain, process or store for sale or re-use an intended quantity of more than 30,000 cubic metres per year of extractive material.

If greater than 30,000m³ of fill material is extracted, stored or stockpiled within a twelve month period, the RTA would be required to obtain an Environmental Protection Licence (EPL) under the POEO Act. The Proposal would not require a licence, as approximately 16,010m³ of fill material would be extracted for Stage 1 construction within a six month period. Approximately 13,730m³ of fill material would be extracted for the remaining sections of the Proposal over the following five years.

Excess cut material disposal

Excess cut material (3,150m³) would be generated by the Proposal. Disposal of excess cut material may occur within the road reserve along fill batters (ie. provide flatter batters). Consideration is being given to the disposal of excess cut material within the nearby quarry property (subject to landowner approval). The excess cut material would be classified as virgin excavated natural material (VENM), and would not involve the generation or storage of hazardous or industrial waste. An Environment Protection Licence would therefore not be required under the POEO Act.

A Section 143 Notice under Section 143 of the POEO Act would be required for the disposal of waste to private properties that are not a licenced waste facility, but can legally accept waste. Should waste from the Proposal be disposed of on a private property, that property owner must complete a Section 143 notice and provide a copy of the notice and DA approval from Council to the RTA.

Use of recycled water

An environmental protection licence would not be required for the irrigation (ie. disposal on to land) of recycled water, providing the disposal or application of recycled water would not directly affect a waterway. If the disposal or application of recycled water would directly affect a waterway, a 'licence to pollute' waterways would be required (RTA 2004b).

Water Act, 1912

Water extraction

A total of 1.8ML (approximately 30,000 L/day for 12 weeks) of water would be used for earthworks compaction and dust suppression.

It is proposed to source recycled water (ie. tertiary treated sewage) from Goulburn Mulwaree Council's sewage treatment plant (STP) in Goulburn. Recycled water would be used for construction purposes (ie. dust suppression). The Proposal site would be classified as a 'uncontrolled' (for the purposes of recycled water use), as the public are not excluded from gaining access to the Proposal site.

If current water restrictions are lifted, water may be sourced from Goulburn's town water supply, or water may be drawn from local water sources such as Wollondilly River, creeks, or dams located within 10km of the Proposal site.

A water sharing plan under the *Water Management Act 2000* does not apply to the Proposal site. Should water for the Proposal need to be drawn from any waterways and used, a licence under Section 10, or a permit under Section 18F of the *Water Act, 1912* may be required from DIPNR. In addition, the RTA's Regional Environmental Adviser, Southern Region, would be advised of the location and methodology in which water would be drawn.

It should be noted that at any time after the completion of writing this REF the above sections of the *Water Act 1912* will be superseded by the *Water Management Act 2000* in the event that a water sharing plan applies to the affected water source. In those circumstances, regard would be given to any new or additional requirements resulting from the applicability of the *Water Management Act 2000* (and any other legislation) to any water source that may be affected by the Proposal.

4 Specialist Studies and Consultation

4.1 Specialist Studies

An Ecological Assessment was undertaken by Hayes Environmental in October 2004. A summary of that study is given in Section 9.5 of this REF. The full report is included as **Appendix A**.

4.2 Consultation

DEC, DIPNR and SCA were provided with the opportunity (via written consultation) to comment on the Proposal in September 2004. The issues raised, and the RTA response, is outlined in Table 4.1 below. A complete copy of all correspondence is provided in **Appendix D**.

Goulburn Mulwaree Council were informed of the Proposal by the RTA Southern Region via a letter dated 22 July 2004. At the request of the RTA Project Manager, Goulburn Mulwaree Council was not asked to provide written comments on the Proposal.

At the time of writing this REF, no reply has been received from DEC.

Table 4.1: Summary of issues raised and RTA's response.

Issue		Where Addressed
Department of Infrastructure Planning and Natural Resources (DIPNR)		
Under Section 12(m) of the <i>Native Vegetation Conservation Act 1997</i> , no approval is required from DIPNR for clearing of native vegetation by the Proposal.		Section 3.5
Any clearing of native vegetation should be minimised to the extent necessary for the work. Any compounds and stockpile sites should be located to avoid impacts on native vegetation.		Section 9.1
Sydney Catchment Authority (SCA)		
The proposed works are located in the hydrological catchment of the dams managed by the SCA. In particular the works are located in the Wollondilly River sub-catchment.		Noted / Section 9.5
The proposed works have the potential to impact on the quality of waters in the catchment during both the construction and operation stages. The Roads and Traffic Authority should consider water quality issues in the design, construction and operational stages of the project. Application of the RTA's <i>Water Policy and Code of Practice for Water Management</i> should substantially address water quality issues of interest to the SCA.		Section 9.5
Planning controls <i>State Environmental Planning Policy No.58 - Protecting Sydney's Water Supply</i> applies to the site. SEPP 58 states that road work on classified roads requires development consent from the local council other than roadwork comprising repair or maintenance. The SCA recommends that the RTA confirm with the local council as to whether they consider a development application is required.		Section 3.3
Matters for consideration - Irrespective of whether the proposal is assessed under Part 4 or 5 of the <i>Environmental Planning and Assessment Act</i> , there is a need for decision making authorities		Section 3.3

Issue	Where Addressed
to consider clause 10 of SEPP 58. Therefore the development application or the Review of Environmental Factors (REF) should specifically address each part of clause 10.	
Stormwater management - The SCA considers there may be opportunities to improve the management of stormwater from adjacent sections of the highway in conjunction with the works required for the proposal. The SCA encourages the RTA to investigate these opportunities.	Noted
Soil and water management - The SCA would like the opportunity to comment on draft soil and water management plans.	Noted
Approvals - No approvals are required from the SCA for the Proposal (note however that if a development application is required, the Council will need to notify the SCA of the application and provide the Authority with 21 days to provide comments.	Noted

No consultation with the local community has been undertaken to date. However, the affected community would be consulted prior to the commencement of works in accordance with the *RTA's Community Involvement Practice Notes and Resource Manual, 1998*.

On 22 November 2004, the RTA Southern Region discussed the Proposal with Goulburn Mulwaree Council. Council's concerns included the following:

- Turning movements at intersection of Tiyces Lane;
- Right turning movements and associated acceleration/deceleration lanes at Tiyces Lane;
- Sight distances at Tiyces Lane intersection; and
- Temporary traffic control arrangements for Tiyces Lane intersection during construction.

The RTA Southern Region discussed the Proposal with the quarry owner on 22 November 2004. The quarry owner requested that appropriate temporary traffic control arrangements and adequate acceleration/deceleration lanes be provided.

Further dialogue with the Goulburn Mulwaree Council and the quarry owner to address the above issues and any other matters, would be undertaken prior to the commencement of works.

5 Strategic Stage

5.1 Strategic Planning

The Proposal is part of an ongoing commitment by the RTA to address road safety in accordance with the RTA's responsibilities for ensuring a maximum level of service to road users and to maintain appropriate services for adjacent landholders.

The RTA's *Corporate Plan Journey Ahead 2003-2008* states that improving road safety is a number one priority. The Proposal would improve road safety in accordance with RTA's *Corporate Plan Journey Ahead 2003-2008*.

The Proposal incorporates the initiatives of the NSW Government's integrated transport plan, *Action for Transport 2010* and its companion document *Road Safety 2010* by:

- Keeping the road network in good order;
- Getting the best out of the road network; and
- Preventing accidents and saving lives.

The Proposal also supports the following objectives for the National Highway (DoTARS website 2004):

- Facilitating overseas and interstate trade and commerce;
- Allowing safe and reliable access by a significant proportion of Australians to the services provided by major population centres;
- Minimising the cost of the National Highway to the Australian community;
- Supporting regional development; and
- Contributing to ecologically sustainable development.

The Federal Government has committed \$3.5 million for the Proposal, and an additional \$205 million for duplication of the Highway and for other safety works on this Highway to be undertaken (DoTARS website 2004). The proposed realignment works falls within the scope of road safety works.

5.2 Need for the Proposal

A vehicle accident problem has been identified on the northbound (Sydney-bound) carriageway of the Hume Highway at Tiyces Lane. This section of the Hume Highway was duplicated in 1972 (ie. new southbound carriageway constructed), with the old Highway alignment being converted into the northbound carriageway. The northbound carriageway has not been upgraded since 1972, and has a substandard vertical and horizontal alignment, with three tight curves over undulating terrain. The crash history for the northbound carriageway is poor. In the period January 1999 to December 2003, there were 31 crashes, 11 of which were injury crashes. Twenty five of the accidents were "off-road" or "out of control on curve" crashes.

The Proposal would improve road safety by reducing the number of accidents in the vicinity of Tiyces Lane. This improvement in road safety is in accordance with the RTA's *Corporate Plan Journey Ahead 2003-2008*, the NSW Government's integrated transport plan, *Action for Transport 2010* and its companion document *Road Safety 2010*, and supports the objectives for the National Highway (DoTARS website 2004).

6 Concept Stage

6.1 Proposal Objectives

The objectives of the Proposal are to:

- Reduce the number of accidents on the northbound carriageway of the Hume Highway in the vicinity of Tiyces Lane by adjusting the horizontal and vertical road alignment;
- Improve safety of access to and from Tiyces Lane; and
- Improve safety of access to and from the Quarry.

6.2 Constraints

The Proposal has the following constraints:

- Currently approved funds of \$3.5 million to be used by 30 June 2005;
- Statutory environmental obligations (ie. water and ecology protection); and
- The grade of the new northbound Highway carriageway must be less than 8% to comply with the RTA's *Road Design Guide*.

6.3 Options Considered

Do nothing

This option did not achieve any of the Proposal objectives, and was accordingly discounted.

Realign the Hume Highway northbound carriageway in the vicinity of Tiyces Lane

This option (the preferred option) is expected to achieve all Proposal objectives and has accordingly been selected.

7 Design Considerations

7.1 Existing Road

The Hume Highway within the Proposal site is a four lane divided dual carriageway with a posted speed limit of 110km/hr. The Hume Highway northbound carriageway at Tiyces Lane has a substandard vertical and horizontal alignment, with three tight curves over undulating terrain. The existing road surface that is made up of asphalt and gravel pavement, is in good condition.

The asphalt road shoulders are approximately 1.2m to 3m in width. Pavement marking consists of 'white' broken single centre lines and 'white' unbroken road edging. Road drainage consists of constructed earth dish drains, parallel to the existing Highway.

A culvert is present in the centre of the Proposal site, crossing under the northern side of Tiyces Lane, parallel to the Hume Highway. Guard rails are present along the southbound carriageway of the Highway within the Proposal site. No lighting is present along the Highway within the Proposal site.

The Hume Highway links Australia's two largest cities, Sydney and Melbourne. It is a major interstate corridor, carrying road freight worth about \$20 billion annually. Approximately 10 million people use the Highway every year. The Highway also is an important link to regional freight networks (DoTARS 2004).

A quarry has a formalised unsealed access to and from the Hume Highway within the north eastern section of the Proposal site. Access to rural properties is available via Tiyces Lane within the mid-southern section of the Proposal site. There are no formalised pedestrian or cyclist facilities located within the Proposal site.

7.2 Existing and Forecast Traffic

The AADT on the Hume Highway at the nearest location to the Proposal site (ie. at Marulan) is approximately 28,000 for the year 2003. Based on recent increases in traffic numbers, the AADT for 2004 would be approximately 29,500. Heavy vehicles make up approximately 20-25% of all traffic movements. The forecast traffic for the Hume Highway nearby the Proposal site is 32,030 (AADT) for the year 2006, and 37,403 (AADT) for the year 2010.

For the period January 1999 to December 2003, there were 31 crashes, 11 of which were injury crashes. Twenty five of the accidents were "off-road" or "out of control on curve" crashes.

7.3 Design Considerations

The following considerations have been used to formulate the design for the proposed works:

- Topography and layout of the site to minimise the requirement for cut and fill earthworks;
- Proximity of utilities such as telecommunications and gas pipelines for both construction and operation;
- A clear zone of 11m would be applied within fill sections, and a 7.5m clear zone would apply within cut sections. These clear zones have been determined based on criteria outlined in the RTA's *Road Design Guide* (Section 3-37, 3-38). Road safety barriers would be provided where it is not possible to establish desired clear zones;

- Aim to minimise environmental impacts by selecting a route with minimum requirements for vegetation removal, and that would also complement the road design; and
- Take into account all relevant design guidelines such as sight distances, access requirements and drainage considerations.

Note: The proposed 110km/h speed limit meets the Safe Intersection Sight Distance (SISD) design requirements in accordance with the RTA *Road Design Guide*.

7.4 Urban and Regional Design

The Proposal would be designed to blend into the surrounding rural/bushland landscape, which has been impacted by some land clearing. The design would aim to minimise the need for vegetation clearing, and the Proposal site would be subject to comprehensive revegetation to reduce the visual impact of the new and old Highway alignment. Roadside batters and obsolete sections of the existing northbound carriageway would be revegetated as part of the Proposal. Mature trees not requiring removal (ie. beyond the 11m clear zone for fill sections, or 7.5m clear zone for cut sections) would remain in situ, and revegetation works would complement the surrounding environment through the use of locally occurring native plant species.

7.5 Additional Fill Material

General earthworks have been designed to minimise the need to import fill material. Earthworks would consist of the following:

- A total fill volume of 29,740m³ and a total cut volume of 32,890m³. An excess of 3,150m³ of material would be generated by the Proposal. The excess cut material would be disposed of within the road reserve, or within nearby property (subject to landowner approval). Fill material would be sourced from within the Proposal site (ie. cut/fill works), or from an alternate borrow source (eg. overburden from the adjacent quarry).
- A total of 10,860m³ of pavement material (including select material) would be required by the Proposal. Pavement material would be sourced from an adjacent quarry or from a quarry at Exeter approximately 50km from the Proposal site.
- Asphalt (1,060m³) would be sourced from an existing asphalt batch plant at Ingleburn or Canberra.

The extraction or quarrying of materials does not form part of this REF.

7.6 Additional Truck Movements

The supply of materials required for the construction of the Proposal would require up to 2100 additional truck movements throughout a twelve month construction period, at 20 (average) additional truck movements per day. Truck movements are expected to occur over approximately 105 days within the 12 month period (ie. up to 27% of the construction period). This compares to a current daily volume of 7000 heavy vehicles (based on 25% heavy vehicle usage).

The Hume Highway (northbound and southbound carriageways) and Tiyces Lane would be utilised by the Proposal to transport materials and equipment within the Proposal site. The importation of gravel to the Proposal site would require the highest percentage of total truck movements (maximum 50 movements per day, average 20 movements per day, approximately 1,200 movements total).

Due to the moderate percentage of heavy vehicles (20 to 25%) on the Hume Highway, truck movements associated with the construction of the Proposal would have a minor impact on

the local and regional road system and the existing good pavement condition. The additional contribution to heavy vehicle traffic would range from 0.3 to 0.4%.

7.7 Stockpile and Compound Sites

Compound and stockpile sites, including a site office, portaloos, machinery storage areas, staff parking areas and vehicle washdown bays are expected to be established within the Proposal site.

The informal heavy vehicle rest area located to the immediate east of the quarry access location (ie. the old Hume Highway formation) would be utilised for the compound and stockpile site during the works. The area required for a site compound site(s) is expected to be approximately 1,000m², and approximately 10,000m² for stockpile sites.

The location of the site compound/stockpile sites would meet the following criteria in accordance with RTA's *Stockpile Site Management Procedures* (RTA 2001b):

- Be located in flat areas more than 50m from waterways, and not within flood liable land;
- Be within areas which are already disturbed and do not require clearing of native vegetation; and
- Be more than 250m from residents or other activities that may be affected by operational noise or other impacts of the site.

7.8 Design Parameters

The project would involve the realignment of the Hume Highway and modification of the Tiyces Lane/ Hume Highway intersection.

The following design parameters would apply to the Proposal:

- Design and posted speed to remain at 110 km/hr;
- Single two-lane carriageway with 3.5m traffic lane widths (plus turning lanes) with sealed shoulders - 1m (right hand side) and 3m (left hand side);
- A climbing lane for slow vehicles where the grade is equal or greater to 5%; and
- Median width of approximately 20m;
- Flexible pavement with a design life of 30 years;
- Stormwater drainage - transverse to 100 years ARI, and pavement to 5 years ARI;
- A clear zone of 11m would be applied within fill sections, and a 7.5m clear zone would apply within cut sections;
- Vertical alignment (grades) with a maximum slope of 8%; and
- Embankment batter slopes 1.5:1 (maximum).

7.9 Design Outcomes

The outcomes for this Proposal would be:

- Improved travel efficiency and safety for Hume Highway traffic by eliminating the substandard vertical and horizontal alignments;
- Improved access between Tiyces Lane and the Hume Highway; and
- Improved ride qualities.

7.10 Construction Activities

The works would be undertaken by a Single Invitation Contractor, or a Contractor selected after a competitive tendering process, and would include the following activities:

- Installation of temporary erosion, sedimentation and drainage controls;
- Establishment of stockpile and compound sites;
- Removal of vegetation and grubbing (2.5ha);
- Establishment of a clear zone of 11m within fill sections, and a 7.5m clear zone within cut sections;
- Relocation and/or adjustment of signage to suit construction programme requirements;
- Median topsoil stripped and stockpiled on-site by bulldozers, graders, loaders and trucks;
- Surface preparation by graders, dozers, scrapers and other equipment;
- Compaction of the resultant surface using compaction equipment;
- Recycling of suitable excavated material and incorporation of unsuitable material in earthworks within the road reserve (eg. median);
- Cut earthworks to be transported and placed as compacted fill;
- Import of select material for earthworks;
- Importation of gravel materials;
- Compaction by rollers and equipment with trimming by graders;
- Installation of roadside drainage structures (ie. drains, pits, culverts) at chainages 146040, 147180, 147240, 147320, 147360, 147580, 147780 and 147940 (Note: All drainage structures would be pre-fabricated off-site);
- Removal of obsolete drainage structures at chainages 146507, 146950, 147020, 147500 and 147520, and reformation of the disturbed ground to match the surrounding landform;
- Construction of roadside batters;
- Construction of gravel pavement;
- Construction of roadside kerbs and berms (Note: Kerbs and berms would require 450 m³ of concrete);
- Application of asphaltic concrete wearing surface by pavers and rollers;
- Removal of obsolete sections of the existing Highway road pavement and rehabilitation with native seed;
- Revegetation of exposed areas;
- Installation of line marking, sign structures and sign posting;
- Installation of guard rails on the edge of the new northbound carriageway on fill areas, and within the median (as necessary) for median crossovers (ie. at Tiyces Lane); and
- Site clean up and disposal of all surplus waste materials.

Note: Gas and telecommunications utilities are located outside the proposed work areas. Utility adjustments are not expected to be required.

7.11 Construction Equipment

Plant and equipment required for the works would include the following:

- Front end loaders;
- Excavation plant;
- Back hoes;
- Trenching machines;
- Chain saws;
- Jack hammers;
- Dump trucks;
- Bulldozers;
- Graders;
- Stump grinder;
- Vibrating rollers;
- Concrete agitator trucks;
- Concrete and asphaltic paving machines;
- Water tankers;
- Road sweeper;
- Line marking vehicles;
- Light commercial and passenger vehicles;
- Low loader transporters;
- Milling machine; and
- Trucks transporting excavated material from the site or within the site and to deliver material onto the site.

7.12 Construction Staging

The Proposed works would be staged as follows:

- The central section (approximately 1km in length) of the proposed new northbound carriageway would be constructed first (refer to Figure 2.2); and
- The eastern section (approximately 0.9km in length) and western section (approximately 0.6km in length) of the proposed new northbound carriageway would then be constructed (refer to Figure 2.2).

Notes:

- The construction timing for the eastern and western sections has not yet been determined; and
- Each construction stage would be required to tie-in to the existing northbound carriageway of the Hume Highway within the Proposal site.

7.13 Workforce and Working Hours

The workforce would comprise a combination of RTA personnel and sub-contracting crews (approximately 20 people). Construction activities would be undertaken during standard working hours as follows:

Monday-Friday:	7.00am to 6.00pm
Saturday:	8.00am to 1.00pm
Sunday and Public Holidays:	No work

No night-time construction work is anticipated. Should work be required outside of the standard working hours, the procedure contained in the RTA *Noise Management Manual*, "Practice Note vii – Roadworks Outside of Normal Working Hours" would be followed.

8 Background Investigations

8.1 Background Investigations and Database Searches

The following results were obtained from desktop database searches conducted for the study area. The information below provides a summary of the search results. Copies of all the search results are provided in **Appendix E**.

Australian Heritage Database

A search of the Australian Heritage Database was conducted on 16 August 2004 for sites listed in the Mulwaree LGA (Note: Goulburn Mulwaree LGA is listed). A total of 71 sites occur in the Goulburn Mulwaree LGA. Three of the 71 sites are listed on the Register of the National Estate are located at Towrang, approximately 1 km west of the Proposal site. These three listed items are located outside the Proposal site and would not be affected by the Proposal. No other listed sites are located within the vicinity of the Proposal site.

NSW Heritage Office State Heritage Register/Inventory

A search of the State Heritage Register/Inventory was undertaken on 16 August 2004. Fourteen sites are listed on the State register/Inventory for the Mulwaree LGA. No sites occur within the vicinity of the Proposal site. The nearest item 'Rossis Bridge over Wollondilly River' is located in Goulburn approximately 12 km west of the Proposal site, and would not be affected by the Proposal.

Council Heritage Listings

A search of the Mulwaree LEP was undertaken on 11 September 2004 for items of heritage significance. A total of two items were identified for Mulwaree LGA. One of the listed items 'Hillas Farm Homestead and Outbuildings' is not included on NSW Heritage Office State Heritage Register/Inventory as an item listed on the Mulwaree LEP. The 'Hillas Farm Homestead and Outbuildings' listed item does not occur within the vicinity of the Proposal site. The listed item is located in Bannaby approximately 40 km north-east of the Proposal site, and would not be affected by the Proposal.

National Native Title Tribunal

A search of the Native Title Register was undertaken on 21 July 2004 for the Mulwaree LGA. At the time the search was carried out, there were two 'Register of Native Title Claims'. The Proposal site may be located within the southern section of 'Register of Native Title Claims' (No. NC97/007). The 'Register of Native Title Claims' (No. NC97/007) would be dealt with, by the RTA's Property Group prior to the commencement of works. Refer to Section 9.8 for further discussion on this matter.

NSW DEC Aboriginal Heritage Information Management System (AHIMS)

A search of the DEC AHIMS database was undertaken on 27 July 2004 for items of indigenous heritage known to occur within 5 km of the Proposal site. A total of three objects and Aboriginal places are known to occur within 5 km of the Proposal site. The nearest recorded site is located approximately 500 m west of the Proposal site. The three objects and Aboriginal places are all located outside the Proposal site and would not be affected by the Proposal.

NSW DEC Atlas of NSW Wildlife - Threatened Flora and Fauna Records

A search of the DEC Wildlife Atlas was undertaken in September 2004 for recordings of threatened flora and fauna species within 10 km of the Proposal site. A total of 10 threatened fauna species and no threatened flora species have been previously recorded. The 10 threatened fauna species include: Swift Parrot (*Lathamus discolor*), Australian Painted Snipe

(*Rostratula australis*), Regent Honeyeater (*Xanthomyza phrygia*), Grey-headed Flying-fox (*Pteropus poliocephalus*), Large-eared Pied Bat (*Chalinolobus dwyeri*), Spotted-tailed Quoll (*Dasyurus maculatus*), Brush-tailed Rock Wallaby (*Petrogale penicillata*), Green & Golden Bell Frog (*Litoria aurea*), Broad-headed Snake (*Hoplocephalus bungaroides*) and Striped Legless Lizard (*Delma impar*). Refer to Section 9.6 for further discussion on these matters.

DEH Protected Matters (EPBC Act) Database

A search of the EPBC Act database was undertaken on 17 August 2004 for listed matters of National Environmental Significance (NES) potentially occurring within 10km of the Proposal site. A total of 13 threatened species (three birds, two fishes, four mammals, two lizards, two plants) seven migratory species, one threatened ecological community 'Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory' and seven listed marine species (Note: marine species are not relevant to the Proposal site) are considered to potentially occur within 10km of the Proposal site. The Proposal is not in the vicinity of any wetlands of international significance or Commonwealth lands. In addition, the Proposal site is not within 10km of any State and Territory Reserves. Refer to Sections 9.6 and 9.19 for further discussion on these matters.

NSW DPI Noxious Weeds List

A search of the DPI Noxious Weeds List for the Mulwaree LGA was undertaken on 17 August 2004. The search found that several terrestrial and aquatic weeds have been declared noxious within the Mulwaree LGA. Five noxious weeds listed under the NSW *Noxious Weeds Act 1993* for the Mulwaree LGA were recorded within the Proposal site, including *Cassinia arcuata*, *Senecio madagascariensis*, *Rosa rubiginosa*, *Rubus fruticosus* species aggregate and *Eragrostis curvula*. Refer to Section 9.6 for further discussion on these matters.

NSW DEC Contaminated Land Records

A search of the DEC Contaminated Land Records online database on 11 November 2004 found that there are no Contaminated Land Records for the Goulburn Mulwaree LGA. Goulburn Mulwaree Council advised on 17 November 2004 that they have no record of contaminated land present within the Proposal site.

NSW DEC Air Quality Information

A search of the DEC Air Quality online database on 11 November 2004 found that no air quality monitoring is undertaken in the vicinity of the Proposal site (DEC 2004). The nearest monitoring site is located at Nowra, approximately 90km east of the Proposal site.

9 Environmental Assessment

9.1 General

This section of the REF provides a detailed description of the potential environmental impacts associated with the Proposal during both construction and operation, and provides site specific safeguards to ameliorate the identified potential impacts.

The site specific safeguards predominately outline additional site-specific requirements which are not covered by the RTA's QA Specifications – Environmental Protection (Management Plan) G36, G38, G40 and/or QA R178, for inclusion into the Contractors Environmental Management Plan (CEMP) and/or the Project Environmental Management Plan (PEMP). These safeguards would be implemented prior to construction, during construction and post construction. The CEMP and/or PEMP would be reviewed by the RTA's Regional Environmental Adviser, Southern Region prior to the commencement of work.

9.2 Climate

Existing Situation

The area is classified as cool temperate with an average annual rainfall of 666mm. Rainfall is variable throughout the year, peaking at 65mm in January. Mean temperatures range from 1.3oC in July to 28.1oC in January. The Proposal site is also be subject to frosts, snow, moderate winds (mean of 19.2km/hr in September at 3pm) and storm events (Bureau of Meteorology 2004).

Potential Impacts

The Proposal is not expected to impact on the local and/or regional climate. Rainfall at the Proposal site has a low to moderate potential to cause impacts (ie. erosion and sedimentation, wet weather delays) on the implementation of the Proposal.

Safeguards

- Climatic issues relevant to construction practice and timing have been addressed in the section of this REF on 'Landforms, Geology and Soils' and 'Water Quality and Hydrology' (Sections 9.4 and 9.5);
- Works would not be undertaken during periods of heavy rainfall; and
- In the event of heavy rain, works would be delayed until such time as the weather has satisfactorily settled.

9.3 Air Quality

Existing Situation

Existing air quality is expected to be good owing to the rural nature of the surrounding area. Farming surrounding the Proposal site is limited to livestock grazing. Motor vehicles along the Hume Highway would contribute pollutants (ie. vehicle exhaust emissions) to the local air. Operation of farm machinery can be expected to contribute minor pollutants to the local air. Quarry operations have the potential to impact on local air quality during high wind periods. The DEC does not undertake air quality monitoring in the vicinity of the Proposal site (DEC 2004).

'Marulan Cement Works' and 'Southern Meats Goulburn Abattoir' are the top two facilities for pollutant emissions for the former Mulwaree LGA. Marulan Cement Works at Marulan

South are located 20km east of Proposal site, and Southern Meats Goulburn Abattoir are located 15km west of Proposal site. Marulan Cement Works contributes low emissions (ie. less than 25% of total emissions for each substance) of Magnesium oxide fume, Formaldehyde (methyl aldehyde), Oxides of Nitrogen, Nickel carbonyl, and Particulate Matter (10.0 µm). Southern Meats Goulburn Abattoir contributes low emissions (ie. less than 25% of total emissions for each substance) of Ammonia (total), Oxides of Nitrogen, Particulate Matter (10.0 µm), Mercury & compounds and Carbon monoxide. The 'Marulan Cement Works' and 'Southern Meats Goulburn Abattoir' have the potential to impact on local air quality during high wind periods (DEH 2004).

Potential Impacts

During, and immediately after the construction phase, there is potential for a localised deterioration in air quality due to dust generated from exposed surfaces. Moderate dust would be generated during earthworks and construction of the road base and roadside batters, and removal of redundant sections of the existing Hume Highway. Operation of construction machinery can also be expected to contribute minor pollutants to the local air quality. The nearest residence is located approximately 430m to the south of the proposed construction works, and is not expected to be adversely affected by exhaust fumes and/or dust.

The Proposal is expected to have a minimal long-term impact on air quality following the proposed revegetation activities. Operational greenhouse gas emissions can be expected to be less than current emissions. The reduction in exhaust emissions would be due to a reduced road length, removal of curves and vertical grade improvements. Additionally, the Proposal is not expected to encourage increased traffic levels. An increase in vehicle emissions would therefore not result.

Site specific Safeguards

- Construction truck movements would be controlled on site by being restricted to designated routes;
- When dust is visually detected, the frequency of watering would be increased. Where possible, dust generating activities would be reprogrammed to avoid periods of high wind velocity;
- If winds are high and works are creating high levels of dust that are likely to cause discomfort to local residents or a safety hazard to traffic or work personnel, the works would be modified or stopped until the dust hazard is eliminated or has been reduced to an acceptable level;
- Truck loads would be wet down or covered as necessary to suppress dust generation;
- Tailgates would be secured during operation of trucks and utes;
- There would be no burning of timber or wastes;
- Disturbed surfaces would be revegetated progressively during construction of the Proposal; and
- Machinery would be turned off, rather than left idling for long periods.

9.4 Landforms, Geology and Soils

Existing Situation

The Proposal site is located within the Midgee Soil Landscape. The geology associated with this soil landscape is undifferentiated Ordovician and Silurian sediments. Rocks include silty sandstone, siltstone, greywacke, phyllite, shale, slate and quartzite. The soil parent material is

made up of in situ and alluvial-colluvial material derived from the parent rock (Soil Conservation Service of NSW 1991).

The common soils are Yellow Earths and Yellow Podzolic Soils and intergrades. These soils are almost always stony and acid. Other soils include Red Podzolic Soils, Lithosols, Soloths and Red Earths (Soil Conservation Service of NSW 1991).

The landform patterns occurring within this unit include rolling low hills. Elevations vary from 600m in the vicinity of Bungonia to around 900m north of Taralga (Soil Conservation Service of NSW 1991). Elevations within the Proposal site ranges from 650m to 711m (see **Appendix C**). Landform slopes are generally between 10 and 30%. Local relief usually varies between 30 and 100 m. Fixed, shallow erosional stream channels, closely to very widely spaced, form a non-directional or convergent integrated tributary network. Following good rains springs are a feature of sideslopes. Within the soil landscape there is widespread minor to moderate sheet erosion, and gullying of drainage lines (Soil Conservation Service of NSW 1991).

There are no acid sulphate or saline soils present within the Proposal site. The nearest observed salinity area (ie. sheet erosion with salting) is located approximately 3km west of the Proposal site (Commonwealth of Australia 2001).

Potential Impacts

Construction works (ie. vegetation removal, culvert modification, placement/compaction of fill) within the Proposal site have a minor to moderate potential to cause soil erosion. Minor to moderate soil compaction of soils within the Proposal site can also be expected as a result of movement of earthworks machinery and trucks. Existing drainage structures that would be no longer needed would be removed by the Proposal. Removal of the obsolete drainage structures at chainages 146507, 146950, 147020, 147500 and 147520 would only cause minor localised soil disturbance. Following completion of construction and revegetation works, the potential for erosion is expected to be no greater than the current situation.

The Proposal would alter the existing landform by constructing cut and fill embankments along the new road alignment. Along the proposed carriageway, fill embankments would raise the height of the existing ground level by up to 5m between chainage 146580 to 146780, and up to 2m in other fill sections. Cut embankments would lower the height of the existing ground surface by up to 5m between chainage 147260 to 147500, and up to 5m in other cut sections along the proposed carriageway.

Site specific Safeguards

- An erosion and sedimentation control plan would be developed and incorporated into the CEMP. The plan would incorporate specifications outlined in the *NSW Erosion and Sediment Control Handbook No. 2*, identify areas requiring management controls, include inspections and checklist sheets and be reviewed by the RTA's Regional Environmental Adviser, Southern Region prior to the commencement of works;
- All stockpile sites would be designed, established, operated and decommissioned in accordance with the RTA's *Stockpile Management Procedures 2001*;
- Stockpiles would not be established on slopes greater than 2:1 (horizontal to vertical);
- Stockpiled materials would be stored away from drainage lines;
- The stockpiling of surplus material would not be undertaken during heavy periods of rainfall;
- Batters would be stabilised with local native grasses (and/or sterile exotic grasses) and local native shrubs;

- If greater than 30,000m³ of fill material is extracted, stored or stockpiled within a twelve month period, the RTA would be required to obtain an environmental protection licence ("Licence") under the POEO Act;
- At sites where obsolete drainage structures (chainages 146507, 146950, 147020, 147500 and 147520) are removed, the disturbed ground would be rehabilitated to match the local landform;
- In accordance with RTA's *Stockpile Site Management Procedures 2001*, the site compound/stockpile sites would be located in flat areas more than 50m from waterways, and not within flood liable land; and
- For further related site specific safeguards, refer to Section 9.5 "Biodiversity".

9.5 Water Quality and Hydrology

Existing Situation

Surface water

There are no creeklines or permanent water within the Proposal site. The Proposal site is located within the Towrang Creek catchment. Stormwater flow from the Proposal would enter two unnamed ephemeral waterways located beyond the northern side of the Proposal site. The ephemeral waterways connect to Towrang Creek approximately 1km north west of the Proposal site (western section). Towrang Creek joins the Wollondilly River approximately 2km north west of the Proposal site. The Wollondilly River then flows for approximately 70km before joining Lake Burragarang, Sydney's main water supply. The Proposal is not located within flood prone land, or within the catchment of any Ramsar wetlands.

A culvert is present in the centre of the Proposal site, crossing under the northern side of Tiyces Lane, parallel to the Hume Highway. Road runoff along the existing alignment flows into roadside earth table drains, which eventually flow into Towrang Creek.

Taking into account that Towrang Creek has ephemeral surface water flow, water quality during flow periods would be impacted by sediment transport and agricultural runoff (ie. fertilisers, pesticides). Surface water quality can be expected to be moderate during low flow events (ie. moderate turbidity, nutrient and organochlorine loads), and poor during flood events (ie. high turbidity, nutrient and organochlorine loads).

Groundwater

No registered groundwater bores are present within the vicinity of the Proposal site (CANRI 2004). The elevation in the vicinity of the Proposal site ranges from 650m to 711m (see **Appendix C**). The groundwater level in the vicinity of the Proposal site can therefore be expected to be very deep below the ground surface.

Potential Impacts

Surface water

The Proposal would be limited to cut and fill works, and minor modification and/or introduction of drainage structures (ie. culverts, drains, pits). Alteration of the existing landform by introducing cut and fill embankments along the new road alignment would slightly modify the existing local hydrology within the Proposal site. Stormwater flow from the Proposal site would continue to enter two unnamed ephemeral waterways located beyond the northern side of the Proposal site. The Proposal would not cause any changes in impacts on adjoining properties from road runoff, and is not expected to create any backwaters.

The length of the proposed new northbound carriageway would be marginally shorter than the existing northbound carriageway. Road runoff from the new northbound carriageway may therefore be slightly less than the existing northbound carriageway following ripping and revegetation of the obsolete section of the existing northbound carriageway (refer to Section 9.5 Safeguards).

Pollution of Towrang Creek and the Wollondilly River caused by the Proposal is not expected to occur. The Proposal is expected to have minimal short-term impacts on the existing water quality due to the combination of low local rainfall and the ephemeral nature of Towrang Creek water flow. During and immediately following construction works there is potential for impacts on the Towrang Creek water quality during rainfall events which could cause sediment runoff.

The potential impacts on water quality of Towrang Creek located approximately 1km north west of the Proposal site are expected to be minor or negligible. Potential impacts could include increased levels of turbidity, sedimentation, and potential changes in the chemical (pH, nutrients, dissolved oxygen, and inorganic and organic matter) and physical (light penetration, salinity & temperature) parameters of the water. Key risks associated with the construction of the Proposal include the deposition of sediments into the receiving waters of Towrang Creek during excavation and fill works. Water quality has the potential to decrease through the release of polluted water and wastes associated with construction works, vehicle washdowns, cement washouts, and from accidental spills of fuels, hydraulic fluid, asphalt spillage, welding and pavement materials and chemicals.

If current water restrictions are lifted, water may be sourced from local water sources such as Wollondilly River, creeks, or dams located within 10km of the Proposal site. If water is sourced from the Wollondilly River or local creeks or dams, this would reduce the amount of water available for other land uses from these water sources (particularly for local creeks or dams).

There would be a minor reduction in operational road runoff due to the reduced road length of the realigned Hume Highway, and due to removal of redundant sections of the existing Hume Highway. Drainage would be directed to existing flow paths. The Proposal is not expected to cause any flooding impacts within and beyond the Proposal site.

Operational vehicle pollutants including hydrocarbons and combustion derivatives, lubricating oil, petroleum, rubber, and heavy metals also have the potential to enter unnamed ephemeral drainage lines, which connect to Towrang Creek. Pollution generated from operation of the Proposal would expect to be no different to pollution from the existing road runoff. The Proposal is not expected to impact on surface water quality of Towrang Creek or its receiving waters providing safeguards below are implemented.

Recycled water may be used by the Proposal for construction purposes (ie. dust suppression). The recycled water has the potential to contain a number of contaminants that can pose an environmental threat. These contaminants may include the following:

- Solids, dissolved carbon and nutrients;
- Pesticides, herbicides, garden chemicals and pharmaceuticals; and
- Pathogens, including bacteria, viruses, and helminths (Independent Expert Panel on Environmental Flows for the Hawkesbury Nepean, Shoalhaven and Woronora Catchments 2003).

Use of recycled water within the Proposal site for non-potable uses has a potential to cause contamination of receiving waterways within and beyond the Proposal site, and/or to harm human health if accidentally ingested within or adjacent to the Proposal site. Recycled water contains chemicals, which are known to be carcinogenic (ie. cancer causing), and contains endocrine disrupter chemicals, which can mimic natural hormone systems and result in

harmful effects (Independent Expert Panel on Environmental Flows for the Hawkesbury Nepean, Shoalhaven and Woronora Catchments 2003).

Taking into account the absence of any permanent water bodies present within or nearby the Proposal site, and that Lake Burragorang (Sydney's main water supply) is located over 70km to the north west of the Proposal site, the potential for recycled water to cause contamination of receiving waters is low. The potential for recycled water to cause harm to human health is low, as accidental ingestion of recycled water by workers or the public is not likely to occur within or adjacent to the Proposal site.

Groundwater

The proposed works are not expected to make contact with the groundwater table, which is expected to be very deep below the ground surface. The Proposal is not expected to impact on groundwater quality within the Proposal site, providing safeguards below are implemented.

Site specific Safeguards

- The Proposal would be undertaken in accordance with RTA's *Water Policy and Code of Practice for Water Management*;
- Should any spillage occur during construction the RTA's Regional Environmental Adviser, Southern Region, would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of in accordance with DEC requirements;
- An incident emergency spill plan would be developed and incorporated in the CEMP. This would include measures to avoid spillages of fuels, chemicals, and fluids onto the floodplain and/or into any waterways. All personnel would be made aware of these measures. An emergency spill kit would be kept onsite at all times;
- No construction or operational water would be permitted to be discharged to "quarry" land located to the north of the Proposal site;
- If the disposal or application of recycled water would directly affect a waterway, a 'licence to pollute' under the POEO Act waterways would be required;
- Recycled water would only be drawn from an environmental discharge (or draw point) licensed by the DEC;
- Recycled water to be used by the Proposal would need to meet the 'Minimum Water Quality Requirements for Recycled Water (Uncontrolled Access)' specified in Tables 1 and 2 of the *RTA's DRAFT Discussion Paper: The Viability of Using Recycled Water at RTA Project Sites on a Statewide Basis 2004*;
- Written certification would need to be acquired from the sewage treatment plant (STP), stating that the recycled water being provided by the STP is equal to the water quality standard requested by the RTA;
- Use of recycled water would need to be undertaken in accordance with the 'Work Practices' outlined in *RTA's DRAFT Discussion Paper: The Viability of Using Recycled Water at RTA Project Sites on a Statewide Basis 2004*;
- The RTA's Regional Environmental Adviser, Southern Region, would need to approve the use of recycled water prior to collection (and application to land) of the recycled water;
- Any material transported onto pavement surfaces would be swept and removed regularly and at the end of each working day;

- Regular maintenance and checking of the sediment controls would be undertaken (at least every week and after a major rainfall event) and records kept. Sediment would be cleared from behind barriers on a regular basis;
- Within the Proposal site, compacted hard stand surfaces would be established at entry/exit points which connect the proposed realignment route to the existing Hume Highway;
- Should water for the Proposal need to be drawn from any waterways and used, a licence under Section 10, or a permit under Section 18F of the *Water Act, 1912* may be required from DIPNR. In addition, the RTA's Regional Environmental Adviser, Southern Region, would be advised of the location and methodology in which water would be drawn;
- If water is sourced from farm dams, water would only be sourced from properties that comply with their harvestable right. Note: Under the DIPNR *Farm Dams Policy (1999)*, landholders have a right to a portion (10%) of the runoff from their property without needing a licence. This is known as the 'harvestable right' (DIPNR 1999);
- Appropriate sediment controls would be installed adjacent to drainage lines to separate clean and dirty water, and to filter dirty water prior to discharge to drainage lines;
- All sedimentation control structures would be removed only after adequate stabilisation of disturbed surfaces is achieved;
- New culverts would be positioned to ensure that water discharges do not cause backwaters and/or erosion and sedimentation problems;
- Culverts would be designed and constructed in such a way as to minimise disturbance to any waterways and in accordance with *NSW Government's Flood Policy 1984*, and in the *NSW Government's Floodplain Management Manual 2001*;
- Any wastewater generated from construction processes would be contained onsite and/or treated to a DEC certified process prior to its disposal. The release of dirty water into waterways would be prohibited;
- All concrete works would be undertaken in accordance with the EPA *Environmental Best Management Practice Guideline for Concreting Contractors (2002)*;
- Vehicle washdowns and/or cement washouts would be undertaken within a designated bunded area with an impervious surface or undertaken off site; and
- No temporary or permanent sedimentation basin is proposed to be constructed for the Proposal. Should it at any stage, be required to do so, the RTA's Regional Environmental Adviser, Southern Region would be contacted and consulted and an additional impact assessment undertaken.

9.6 Biodiversity

An ecological assessment for the Proposal was undertaken for the RTA, by Hayes Environmental in October 2004. During the surveys, the Proposal site and its immediate surrounds were surveyed for flora and fauna (Refer to **Appendix A**).

Existing Situation

Flora

The majority of the Proposal site is located within the median strip between the two existing carriageways of the Hume Highway, and supports a native woodland vegetation community. However, the western end of the Proposal site is predominantly open grassland, and the

eastern end of the Proposal site, east of an existing quarry, supports only narrow strips of woodland fringing the Hume Highway, and heavily grazed pasture on freehold land to the north and south of the Highway.

The vegetation present throughout the Proposal site is a fairly uniform woodland community. Dominant canopy species present include Brittle Gum (*Eucalyptus mannifera* ssp *mannifera*), Yellow Box (*Eucalyptus melliodora*) and Argyle Apple (*Eucalyptus cinerea*) in the central part of the Proposal site. Scribbly Gum (*Eucalyptus rossii*) occurs in the grassy woodland areas in the western part of the Proposal site, and Silvertop Ash (*Eucalyptus seeberi*) is dominant in the eastern part of the Proposal site. The canopy throughout the Proposal site has approximately 45% cover, and reaches up to 10-15m in height.

The shrub layer throughout the Proposal site is very sparse, consisting mainly of scattered shrubs of *Mimosaceae*, *Proteaceae*, *Faboideae* and *Epacridaceae*. These plants are present throughout the Proposal site. Many of the Acacia's and the Grevillea's would have been planted as part of the revegetation works following construction of the Highway. Acacia's were the dominant shrub-layer species throughout the Proposal site. The shrub layer varies from 0-55% cover and reaches up to 1.5-2m in height.

The groundcover throughout the Proposal site varies from relatively deep accumulations of leaf litter, to 100% grasses. With the exception of occasional random patches where *Lomandra* spp and Kangaroo Grass (*Themeda australis*) dominate, no grass species dominated in any one area.

Five noxious weeds listed under the NSW *Noxious Weeds Act 1993* for the Mulwaree LGA were recorded within the Proposal site. The noxious weeds include *Cassinia arcuata*, *Senecio madagascariensis*, *Rosa rubiginosa*, *Rubus fruticosus* species aggregate and *Eragrostis curvula*.

Conservation Significance

No TSC Act listed threatened flora species have been previously recorded within 10km of the Proposal site. Two EPBC Act listed threatened flora species have the potential to occur within 10km of the Proposal site (Thick-lipped Spider-orchid *Caladenia tessellate*, and Austral Toadflax *Thesium australe*). No flora species, populations or communities listed as threatened on either the TSC Act or EPBC Act were recorded during field surveys conducted in the Proposal site. No Rare or Threatened Plant Species (ROTAP's) were recorded in the Proposal site during the field surveys. The habitats present within the Proposal site are not expected to be suitable for any TSC Act or EPBC Act listed species.

Fauna

Fauna habitat features and resources present within the Proposal site include:

- Areas of disturbed open woodland with a variety of canopy tree species which provide potential foraging resources at different times of year for parrots and honeyeaters;
- An open canopy of trees adjacent to areas of grassland/pasture which provides a potential roosting resource for some raptors and large insectivorous birds;
- Some small tree-hollows which provide potential shelter and nesting opportunities for microchiropteran bats and small hollow-dwelling birds (refer to Figure 2 in **Appendix A**). No medium or large tree-hollows were recorded in the Proposal site;
- Deep accumulations of leaf litter in some areas provide a potential shelter and foraging resource for some smaller reptile species; and
- Some areas of dry stony ground provide potential shelter for invertebrates and small reptiles.

No dens, nests, wombat holes, obvious fauna trails or other evidence of native fauna occupying the Proposal site were recorded during the field surveys. The Proposal site does not contain areas of permanent water, caves, rock outcrops, or other important features for native fauna.

The narrow strips of woodland and single rows of trees fragmented by existing road pavement and access tracks at the eastern end of the Proposal site, are of little value for any but the most mobile and disturbance-tolerant native fauna (eg. birds and microchiropteran bats).

The whole of the Proposal site is considerably affected by noise associated with the existing Hume Highway. Only the more disturbance-tolerant fauna species would be expected to occur within the Proposal site. Most native fauna would prefer the extensive areas of native vegetation, which are located to the south and particularly to the north of the Proposal site. The Highway currently provides a barrier to movement of these species, as no evidence for their movement across the Highway was recorded (eg. tracks, scratches on trees, landing pads of gliders, bones on the ground).

Fauna recorded within the Proposal site were mainly the dominant and disturbance-tolerant insectivorous birds such as the Australian Magpie, Australian Raven and Laughing Kookaburra. The Crested Pigeon was recorded foraging on the ground in pasture areas adjacent to the Highway. Several small passerine birds (eg. fairy-wrens, thornbills) were heard calling from woodland to the north, outside of the Proposal site.

Two small skink species were recorded within the Proposal site during the surveys, and it is likely that other small skinks and lizards would also occur within the Proposal site.

There are no culverts or waterways of value within the Proposal site. No amphibian species were recorded during the surveys, and none are likely to occur due to the lack of permanent water. Common and more mobile amphibians may temporarily inhabit the Proposal site during wet seasons.

Native mammals recorded in the Proposal site include common terrestrial species such as the Common Wombat, Swamp Wallaby and Eastern Grey Kangaroo. Introduced mammals recorded include the Rabbit and Fox.

No arboreal mammals, nor evidence for such species, were recorded in the Proposal site. These species would not be expected to occur in such close proximity to the Highway, given that extensive tracts of native woodland occur on adjacent lands to the north and south of the Proposal site.

No microchiropteran bat activity was observed during evening surveys. However, microchiropteran bat species known to occur in the locality have the potential to move through the Proposal site on occasions. The Proposal site is not likely to be of particular value given the degraded nature of vegetation present, and its proximity to the noise disturbances of the Hume Highway.

Conservation Significance

Ten TSC Act listed threatened fauna species have been previously recorded within 10km of the Proposal site (Swift Parrot, Australian Painted Snipe, Regent Honeyeater, Grey-headed Flying-fox, Large-eared Pied Bat, Spotted-tailed Quoll, Brush-tailed Rock Wallaby, Green & Golden Bell Frog, Broad-headed Snake and Striped Legless Lizard).

Nine EPBC Act listed threatened fauna species have the potential to occur within 10km of the Proposal site (Swift Parrot, Australian Painted Snipe, Regent Honeyeater, Large-eared Pied Bat, Spot-tailed Quoll, Brush-tailed Rock-wallaby, Grey-headed Flying-fox, Striped Legless Lizard, Broad-headed Snake).

No threatened fauna species, populations or communities listed as threatened on either the TSC Act or EPBC Act were recorded during field surveys conducted within the Proposal site.

Habitat and resources are present within the Proposal site that may be suitable for the Striped Legless Lizard (TSC Act and EPBC Act listed). Habitats and resources present within the Proposal site are not expected to be suitable for any of the other TSC Act or EPBC Act listed species.

Migratory species (EPBC Act listed) including the White-bellied Sea Eagle, White-throated Needletail, Black-faced Monarch, Satin Flycatcher and Regent Honeyeater are known to occur within 10km of the Proposal site. None of these migratory birds were recorded during field surveys conducted within the Proposal site. All of these migratory birds have the potential to occur within the Proposal site.

The Proposal site does not support 'potential koala habitat' as defined under SEPP 44, therefore SEPP 44 does not apply to the proposed works.

Potential Impacts

Flora

The proposed works would involve clearing of approximately 3ha of vegetation present within the median within the Proposal site (Refer to Figure 2.2). The Proposal is likely to require the removal of the majority of the native vegetation (ground cover, shrub and canopy species) present within the median strip of the existing Highway. No clearing of vegetation located on the northern side of the existing northbound carriageway is expected to be required.

The Proposal site does not support unique flora features or species that would be lost as a result of the proposed clearing. All flora species recorded within the Proposal site are likely to be present in surrounding areas.

The potential discharge of oils and other pollutants, and increased erosion and sedimentation could cause indirect impacts on native flora located within riparian zones of ephemeral waterways adjacent to the Proposal site. The discharge of oils has the potential to degrade soil and water quality, and sedimentation could increase nutrient loadings within the ephemeral waterways and in the soils within the riparian zone.

The Proposal would remove topsoil within the Proposal site along the alignment of the new northbound carriageway. The Proposal has the potential to cause noxious weeds present within the Proposal site to be spread into areas surrounding the Proposal site.

Conservation Significance

Given the degraded and fragmented nature of the majority of bushland present within the Proposal site, no threatened flora species are considered likely to be present within the Proposal site, and none are considered likely to be affected by the Proposal.

Fauna

Mobile and disturbance-tolerant native fauna (eg. birds and microchiropteran bats), and wombats, macropods and reptiles would move away from the noise and vibration of construction machinery, and would be unlikely to be directly affected by the proposed works. These fauna species would be expected to return to the Proposal site following completion of construction works.

The Proposal would remove native woodland vegetation that provides some habitat (ie. food and shelter) for native fauna, in particular birds, bats and reptiles that are disturbance-tolerant. Fauna species that are not disturbance-tolerant would prefer the extensive areas of native vegetation, which are located to the south and particularly to the north of the

Proposal site. The Proposal has a potential to impact on wombat holes (ie. holes would be filled in and compacted) present within the Proposal site. The Proposal would not introduce any new barriers to fauna movements within or across the Proposal site.

The potential discharge of oils and other pollutants during construction and operation of the Proposal, and increased erosion and sedimentation could cause indirect impacts on native fauna that inhabit the riparian zones of ephemeral waterways adjacent to the Proposal site. The discharge of oils has the potential to degrade soil and water quality, and sedimentation could increase nutrient loadings within the ephemeral waterways and in the soils within the riparian zone.

Conservation Significance

The Striped Legless Lizard was not observed during the ecology assessment, and does not appear to occur in areas of potential habitat within the study area. The lizard is therefore unlikely to be affected by the proposed works. Given the limited nature of habitats and resources present within the Proposal site, no other threatened fauna species (TSC or EPBC Act listed) are considered likely to utilise parts of the Proposal site that would be cleared for the proposed works, and none are considered likely to be affected by the proposed works.

None of the threatened species (TSC or EPBC Act listed) are considered likely to be affected by the proposed works due to:

- The degraded and fragmented nature of habitats and resources present within the Proposal site, particularly within the median strip, which is the area to be directly affected by the proposed works;
- The noise and light disturbances associated with the existing Hume Highway;
- Availability of extensive areas of habitat and resources located in adjacent lands to the north and south of the Proposal site. These adjacent areas are relatively intact, and are not as affected by Highway disturbances. Most native fauna would utilise these areas rather than the disturbed nature of the Proposal site;
- The lack of evidence for any of the threatened species or their habitat occurring within the Proposal site; and
- The lack of critical features or resources for any of the threatened species.

The proposed works would not introduce any new barriers to existing movement routes for threatened species, which may occur on lands to the north or south of the Proposal site. The proposed works are not considered likely to impose a significant impact upon migratory species, and the proposed works would not affect any EPBC Act declared critical habitat.

Compensatory measures are not regarded as necessary for the Proposal, because:

- The Proposal is not expected to significantly affect any threatened fauna species; and
- The majority of the vegetation is currently in a degraded condition, and only a limited amount of clearing (total 3ha) would be required.

Site specific Safeguards

- All topsoil disturbed by the Proposal would be stripped and stockpiled within the Proposal site for later reuse in rehabilitation works;
- In accordance with RTA's *Stockpile Site Management Procedures 2001*, the site compound/stockpile sites would be located within areas which are already disturbed and do not require clearing of native vegetation;
- Hollow bearing trees located within the Proposal site would be retained where possible;

- Where possible, removal of hollow bearing trees would be conducted outside of the breeding season (August – December) to limit potential impacts on fauna;
- Where possible, removal of hollow bearing trees would be conducted outside the cooler months (June, July) when bat species may be in torpor;
- To provide habitat features for native fauna, large trees (particularly those containing small hollows) would be removed relatively intact and placed on the ground in bushland areas to be retained within the road corridor and beyond clear zones (where possible);
- Tree-hollows present in trees to be cleared would be inspected immediately prior to clearing. Where native fauna are found, the trees would be removed at dusk (if practical), and the native fauna would be relocated to nearby suitable habitat. If native fauna are injured, these would be transferred to the care of WIRES or other local animal rescue network;
- Rather than removing whole trees, lopping of tree branches would be undertaken where possible to retain fauna habitat;
- If a substantial time period elapses prior to commencement of proposed works (ie. 6 months), additional targeted surveys would be conducted for the Striped Legless Lizard (*Delma impar*), to ensure that it has not moved into potential habitat present within the Proposal site;
- If Wombats are found in holes during clearing works, they would be relocated to nearby suitable habitat. The holes would be filled in and compacted, and the surrounding area cleared of vegetation to discourage the Wombat from returning to the holes. Empty Wombat holes would also be filled in when found;
- Relocation, rescue and/or rehabilitation of fauna would be undertaken by person(s) suitably licensed to undertake the activity (ie: WIRES, FAWNA). Note: A licence is required under Section 132(c) of the *National Parks and Wildlife Act 1974* and/or Clause 22 of the *National Parks and Wildlife Regulation 2002* for any person(s) who intends to relocate, rescue and/or rehabilitate protected fauna (as identified under the NPW Act);
- The extent of clearing and disturbance to the native vegetation would be kept to a minimum so that impact on flora and fauna is restricted. Within the Proposal site, vegetation would only be removed in areas that are necessary to enable the new northbound carriageway to be constructed. Vegetation to be retained within and beyond the Proposal site would be protected by fencing, staking and/or marking on construction drawings;
- All trees to be retained within the immediate vicinity of the proposed works would be protected by fencing (or other approved means) at the drip-line of trees, to prevent them from damage by construction plant and machinery;
- Trees including branches and leaves, which are excess to needs for fauna habitat provision would be chipped/mulched on-site and used in revegetation works within the Proposal site;
- Locally indigenous plant species recorded in Appendix I of the ecological assessment (refer to **Appendix A**) would be used in revegetation works;
- Obsolete sections of the existing northbound carriageway of the Hume Highway would be ripped and revegetated using seed from locally indigenous plant species;

- Seed from locally indigenous plant species would be used for revegetation of all areas disturbed by the Proposal, to provide habitat features for native flora and fauna, and to maintain the local and regional genetic resource;
- Noxious weeds present within the Proposal site (*Cassinia arcuata*, *Senecio madagascariensis*, *Rosa rubiginosa*, *Rubus fruticosus* species aggregate and *Eragrostis curvula*) would be removed and/or destroyed, and disposed of appropriately in accordance with their category under the *Noxious Weeds Act 1993*;
- Any private land (ie. land located outside the road corridor) impacted by the Proposal would be restored to satisfy landowner requirements (ie. to appropriate land contours, soil condition and vegetation cover);
- Revegetation areas would be monitored every two months for the first six months and then every 6 months for two years. Monitoring would assess establishment success, weed abundance, grazing impacts, and any dead plants would be replaced; and
- Should additional vegetation removal be required, the proposed variation to the original scope would be referred to the RTA's Regional Environmental Adviser, Southern Region to determine if any further environmental impact assessment is required.

9.7 Socio-economic Considerations Including Landuse

Existing Situation

Landuse surrounding the Proposal site includes a quarry (gravel extraction) located adjacent to the north eastern section of the Proposal site. An informal heavy vehicle rest area is also located to the immediate east of the quarry access location. An RTA truck rest area is located 30km west of Proposal site, and a service centre (fuel, food) is located 10km east of Proposal site. Other land uses surrounding the Proposal site include environmental protection (north west of Proposal site) and rural (all other areas adjacent to the Proposal site). The nearest residence to the Proposal site is located approximately 430m south of the Hume Highway adjacent to Tiyces Lane. Another residence is located approximately 500m south east of the Proposal site (eastern end).

Approximately 10 million people use the Highway every year. The Hume Highway is also a major interstate corridor, carrying road freight between Sydney and Melbourne, and is part of an important link to regional freight networks (DoTARS 2004).

Potential Impacts

The Proposal would retain access to Tiyces Lane and the quarry. Traffic would be maintained throughout construction by utilising sections of the existing Highway and a temporary side track between chainage 146500 to 146800. The Hume Highway realignment is not expected to cause induced traffic.

Short term disruption to traffic flows can be expected to occur during construction of the Proposal. For short durations, northbound traffic would be limited to one-lane only and reduced speed limits (80, 60 and 40km/hr) would apply. Quarry operations, and commercial and private Hume Highway traffic, would be expected to be impacted slightly to moderately by the short term changes in traffic operations during the construction works.

Establishment of a compound/stockpile site within the informal heavy vehicle rest area would restrict access to the area for the duration of the Proposal. Impacts on heavy vehicle rest area users are expected to be minor. Truck drivers would be able to utilise other alternative formal RTA truck rest areas located at regular intervals on the northbound carriageway.

The community is expected to benefit from the realignment works, due to improved traffic flow and safety, and fewer delays as a result of accidents and the ensuing maintenance

activities. The quarry access turning lanes would also improve road safety for heavy and light Highway vehicles entering and exiting the site.

The nearest residences, located approximately 430m and 500m from the Proposal site, would not be expected to be subject to noise exceedances (ie. 'background' +5dBA) during construction activities. These same residences are not expected to be adversely affected by exhaust fumes and/or dust.

Site specific Safeguards

- Traffic management controls would be implemented during the construction period and traffic would use the existing roadway during construction in accordance with a Traffic Management Plan. All temporary traffic control measures would be undertaken in accordance with traffic control plan TCP66 in RTA's *Traffic Control at Work Sites manual* and RTA's QA Specification G10 *Control Of Traffic*;
- Northbound access along the Hume Highway would be maintained during construction of the Proposal;
- Access between the Hume Highway, Tiyces Lane and the quarry would be maintained during construction and operation of the Proposal;
- Access onto and along the construction site would be monitored and restricted in order to limit the potential damage upon neighbouring property and vegetation;
- Temporary access would be provided as necessary, in order to minimise any potential disruption to traffic, and designed in such a way to ensure that the safety of motorists using the Hume Highway is paramount;
- Adequate signage and safety barriers would be erected to inform and alert motorists to the presence of changed traffic conditions, and the existence of traffic hazards and construction traffic in the area;
- The quarry owners would be consulted regarding their access requirements;
- Notifying all local residents of any potential disruptions that they may encounter, regarding access and traffic flows during the construction of the Proposal; and
- Traffic management measures would be implemented to manage traffic during connections of the new roadworks with the existing Hume Highway.

9.8 Indigenous Heritage

Existing Situation

A search of the DEC AHIMS (See **Appendix E** of this REF) was undertaken on 27 July 2004. The search found that three objects and Aboriginal places are known to occur within 5km of the Proposal site. The nearest recorded site is located approximately 500m west of the Proposal site. The three objects and Aboriginal places are all located outside the Proposal site and would not be affected by the Proposal.

An inspection of the Proposal site for objects or places of indigenous heritage was undertaken by the Pejar Local Aboriginal Land Council (LALC) and the RTA's Aboriginal Program Consultant (APC) in October 2004. The site inspection located no objects or places of indigenous heritage. An archaeological assessment was not recommended by the RTA's Southern Region APC. A copy of the Pejar LALC report is included in **Appendix F** of this REF.

A search of the National Native Title Tribunal Claims database on 21 July 2004 for the Mulwaree LGA revealed there are two 'Register of Native Title Claims'. The Proposal site

may be located within the southern section of 'Register of Native Title Claims' (No. NC97/007).

Potential Impacts

As no known indigenous heritage objects or places are present within the Proposal site, impacts on indigenous heritage within the Proposal site are not expected from earthworks and the movement of vehicles and equipment.

Site specific Safeguards

- In the event that any indigenous objects are located during the works, all work would cease in the vicinity of the find, and the RTA's Regional Environmental Adviser Southern Region, RTA's Aboriginal Programs Consultant Southern Region, and NSW DEC would be contacted; and
- The RTA's Property Group would be consulted prior to the commencement of works to determine if the Proposal site is located within the southern section of 'Register of Native Title Claims' (No. NC97/007).

9.9 Non-indigenous Heritage

Existing Situation

A search of the State Heritage Register/Inventory undertaken on 16 August 2004 found that no sites occur within the vicinity of the Proposal site. The nearest item 'Rossis Bridge over Wollondilly River' is located in Goulburn approximately 12km west of the Proposal site.

A search of the Mulwaree LEP undertaken on 11 September 2004 found that no sites occur within the vicinity of the Proposal site. 'Hillas Farm Homestead and Outbuildings' is listed on the LEP, but is not included on NSW Heritage Office State Heritage Register/Inventory as an item listed on the Mulwaree LEP. The 'Hillas Farm Homestead and Outbuildings' listed item is located in Bannaby approximately 40km north-east of the Proposal site.

A search of the Australian Heritage Database on 16 August 2004 found that no sites occur within the vicinity of the Proposal site. The nearest listed item (Towrang Bridge and Culverts – Register of National Estate listed) is located at Towrang approximately 800m west of the Proposal site.

No relics are known to be present within the Proposal site.

Potential Impacts

The Proposal would not impact on any heritage items listed on the State Heritage Register/Inventory or Mulwaree LEP. The Proposal is not expected to impact on any relics within the Proposal site.

Site specific Safeguards

- In the event that any non-indigenous relics are located during the works, all work would cease in the vicinity of the find, and the RTA's Regional Environmental Adviser, Southern Region would be contacted.

9.10 Visual, Landscape and Urban Design

Existing Situation

The existing visual amenity at the Proposal site is considered to be moderate owing to the rural character. The land surrounding the Proposal site is used for agricultural purposes, a quarry, an informal heavy vehicle rest area and environmental protection. Remnant vegetation adjacent to the Proposal site ranges from dense to scattered native bushland.

Remnant native vegetation within the median is generally moderate in density, with some grassed sections. No creeklines are present within the Proposal site, and constructed earth dish drains are present parallel to the existing Highway.

No residences are located in close proximity to the Proposal. The nearest residence to the Proposal site is located approximately 430m south of the Hume Highway adjacent to Tiyces Lane. Another residence is located approximately 500m south east of the eastern end of the Proposal site.

Due to visual screening provided by vegetation present within and surrounding the Proposal site, the Hume Highway is not expected to be visible from the residences surrounding the Proposal site.

Potential Impacts

Construction of the new northbound carriageway, including removal of native vegetation (3 ha) within the median, and construction of cut and fill embankments would reduce the visual amenity of the Proposal site in the short term. Construction of the new carriageway would have a moderate impact on the visual amenity for road users. Adverse impacts on the visual amenity for the surrounding residences would not be expected due to separation distances (minimum of 430m), and visual screening provided by existing vegetation surrounding the Proposal site.

The visual impact of the vegetation removal would decline with time as the revegetation works mature. Removal and revegetation of obsolete sections of the northbound carriageway would also enhance the visual amenity of the Proposal site in the long term. The existing moderate visual amenity at the Proposal site can be expected to be maintained in the long term following completion of the works.

Site specific Safeguards

To mitigate against any potentially negative impacts on the existing visual amenity, the following are proposed:

- Following completion of construction activities, the Proposal site would be subject to comprehensive revegetation which would be undertaken to reduce the visual impact of the new carriageway. Revegetation works would be concentrated at the following locations:
 - All vegetated areas disturbed by the construction works;
 - New road embankments/batters;
 - Within the median between the two carriageways; and
 - Along the bypassed sections of the existing northbound carriageway.
- Revegetation works would utilise local native species specified in the ecology report (see **Appendix A**); and
- A revegetation plan would be prepared for the Proposal, and would be reviewed by the RTA's Regional Environmental Adviser, Southern Region prior to commencement of revegetation works.

9.11 Noise and Vibration

Existing Situation

No residences are located in close proximity to the Proposal site. The nearest residence to the Proposal site is located approximately 430m south of the Hume Highway adjacent to Tiyces Lane. Another residence is located approximately 500m south east of the eastern end of the Proposal site. These residences are currently subject to light and heavy vehicle noise

impacts. The nearest quarry building is located approximately 125m to the north of the Proposal site.

The AADT on the Hume Highway at the nearest location to the Proposal site (ie. at Marulan) is approximately 28,000 for the year 2003. Based on recent increases in traffic numbers, the AADT for 2004 would be approximately 29,500. Heavy vehicles make up approximately 20-25% of all traffic movements (ie. 7,375 of the 29,500 average daily traffic would be heavy vehicle movements). Existing road traffic noise levels would accordingly be expected to be moderate within the Proposal site.

Potential Impacts

Construction:

Moderate noise would be generated from the operation of construction machinery. Construction machinery that would emit the most noise would include excavation plant, chain saws, stump grinders, jack hammers, trucks, bulldozers, graders and vibrating rollers. Quarry trucks entering and leaving the quarry site would be expected to have a minor cumulative noise impact in combination with noise generated by the construction works for the Proposal.

Due to the ample separation distance between the Proposal site and the nearest residences (located a minimum of 430m from the Proposal site), no residences are expected to be subject to noise and/or vibration impacts from construction activities. Due to the adequate separation distance between the Proposal site and quarry buildings, no quarry buildings are expected to be subject to vibration impacts from the Proposal.

Operation:

Due to the ample separation distance between the Proposal site and the nearest residences (located a minimum of 430m from the Proposal site), the Proposal is not expected to alter the existing road noise impacts on residences surrounding the Proposal site. It is not expected that there would not be any increase in maximum noise level events.

Site specific Safeguards

- Should works be required outside standard working hours, the procedures contained in the RTA's *Environmental Noise Manual 2001*, "Practice Notes vii – Roadworks Outside of Normal Working Hours" would be followed;
- The two nearby residents (at 430m south of the Hume Highway adjacent to Tiyces Lane, and 500m south east of the eastern end of the Proposal site) would be contacted prior to the commencement of works via letter box drop, or door knock and would be informed of the proposed works, working hours, and period of construction. Residents would also be provided with a contact name and number should any complaints wish to be registered;
- In accordance with RTA's *Stockpile Site Management Procedures 2001*, the site compound/stockpile sites would be located more than 250m from residents or other activities that may be affected by operational noise or other impacts of the site;
- The idling of machinery and equipment for a prolonged period of time would be avoided where possible; and
- Best management practices would be adopted that are consistent with the RTA's *Environmental Noise Manual 2001*

9.12 Contaminated Land

Existing Situation

No contaminated land is listed on the DEC Contaminated Land Register within Goulburn Mulwaree Council. Goulburn Mulwaree Council have advised that they have no record of contaminated land present within the Proposal site.

The Proposal site is currently used for provision of Highway road traffic. It is not anticipated that any contaminated lands would be present within or adjacent to the Proposal site.

Potential Impacts

The Proposal has a low potential to expose contaminated land during construction. The Proposal has the potential to create contaminated land through the spillage of fuels and other chemicals used during the construction. The risk of contamination is low, as the amount of fuels and chemicals used for this type of works is relatively low.

Site specific Safeguards

- Should any spillage occur during the construction activity the RTA's Regional Environmental Adviser, Southern Region would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of in accordance with DEC requirements;
- Any accidental spills would be managed in accordance with the RTA's *Emergency and Incident Response Procedure*;
- Any contaminated waste found would be identified and classified by a suitably qualified consultant; and
- Any contaminated waste identified or generated during the works would be disposed of in accordance with DEC guidelines.

9.13 Waste Minimisation and Management

Potential Impacts

Potential wastes generated from the Proposal would include:

- Bitumen from the obsolete and new roadway, and concrete from obsolete drainage structures;
- Excess road base and cement;
- Cleared vegetation;
- Excess cut material (3,150m³);
- Waste oils and liquids from maintenance of construction plant and equipment;
- Water from vehicle washdowns; and
- Garbage and sewage from site compounds.

The excess cut material would be disposed of within the road reserve, or within nearby property (subject to landowner approval). It is likely that waste material would be disposed of at the Goulburn Waste Disposal Centre located approximately 15km south of the Proposal site.

Site specific Safeguards

The principles of waste management are to minimise the amount of waste generated, recycle waste wherever possible and dispose of the remainder in a responsible manner in accordance with appropriate RTA policy. The RTA adopts the Resource Management Hierarchy principles embodied in the *Waste Avoidance & Resource Recovery Act 2001* (WARR Act).

Accordingly, the following waste minimisation and site specific safeguards are proposed:

- The Resource Management Hierarchy principles of the WARR Act would be adopted. They are as follows:
 - Avoid unnecessary resource consumption as a priority;
 - Avoidance is followed by resource recovery (including reuse of materials, reprocessing recycling, and energy recovery); and
 - Disposal is undertaken as a last resort;
- Waste material generated (ie. bitumen, concrete, cleared vegetation, excess cut material, hydrocarbons, water, garbage and sewage) would be reused or recycled where possible;
- A Waste Management Plan would be prepared in accordance with RTA's QA Specifications and in accordance with RTA's *Waste Minimisation & Management Guidelines, 1998* and the principles of the WARR Act;
- Trees to be removed (ie. not reused/retained within the Proposal site) would be assessed for their value as millable timber;
- All noxious weeds and exotic plant species removed would be bagged and disposed of at a licenced landfill facility;
- All construction materials, surplus soils and wastes generated from the Proposal would be stockpiled and stored at nominated stockpile sites prior to reuse, recycling or disposal;
- All working areas would be maintained, kept free of rubbish and cleaned up at the end of each working day;
- The demolition of any existing structure would be undertaken in accordance with RTA's QA Specification B314;
- Any excess recycled water would be disposed of at a suitable location (ie. STP) in accordance with DEC requirements;
- Wastes would not be stored for long periods during construction of the Proposal. Empty drums of fuels, oils or chemicals and fluids would not be stored on site during construction.

9.14 Associated Infrastructure and Activities

Existing Situation

Telecommunications utilities are present outside the road corridor, adjacent to and parallel to the northbound carriageway. Gas utilities are located outside the proposed work areas.

Impacts

Utility adjustments are not expected to be required, as all utilities are located outside the proposed work areas.

Site specific Safeguards

- It is recommended that the “dial before you dig” hotline be contacted prior to commencement of works.

9.15 Demand on Resources

The demand on resources (ie. pavement material, fill, cement, hydrocarbons and water) is expected to be minimal. Except for water, no materials currently in short supply would be required for the Proposal. Fill material (29,740m³) would be sourced from within the Proposal site (ie. cut/fill works), or from an alternate borrow source (eg. overburden from the adjacent quarry). Pavement material (10,860m³) would be sourced from an adjacent quarry or from a quarry at Exeter approximately 50km from the Proposal site². 1060m³ (asphaltic concrete) of concrete would be batched off-site at an existing batch plant in Goulburn, and delivered in agitator trucks. Concrete (450 m³ for precast kerbs and berms/headwalls) would be batched off-site at an existing batch plant in Goulburn, and precast items delivered to site. Asphalt (1,060m³) would be sourced from an existing asphalt batch plant at Ingleburn or Canberra. Recycling and re-use of material would also assist to reduce the demand on resources.

Water is currently in short supply in the Goulburn area. A total of 1.8ML (approximately 30,000L/day for 12 weeks) of water would be used for earthworks compaction and dust suppression. To reduce demand on water, recycled water (ie. tertiary treated sewage) would be sourced from Goulburn Mulwaree Council in Goulburn. If current water restrictions are lifted, water may be sourced from Goulburn's town water supply, or water may be drawn from local water sources such as Wollondilly River, creeks, or dams located within 10km of the Proposal site.

Site specific Safeguards

- For further related site specific safeguards, refer to Section 9.13 “Waste Minimisation and Management”.

9.16 Cumulative Environmental Effects

The proposed works are part of ongoing maintenance and upgrading of the Hume Highway. It is anticipated in the near future that the RTA would carry out upgrade works on the Hume Highway, approximately 500m to the west of the Proposal site. These works would involve upgrading the Towrang Road and Carrick Road intersections with the Hume Highway to improve road safety. Cumulative impacts of the intersection upgrade works (vegetation removal, fauna impacts, erosion/sedimentation, visual amenity impacts, and water quality impacts) in combination with impacts of the Proposal are expected to be minor.

The positive cumulative benefits of the Proposal would include:

- The community is expected to benefit from the realignment due to improved traffic safety, and fewer delays as a result of accidents and the ensuing maintenance activities.

Negative cumulative impacts of the Proposal would include:

- Clearing of native vegetation, and potential weed growth within the Proposal site and on adjacent land;
- Erosion and sedimentation, and potential water quality impacts during construction; and

² Environmental impacts of sourcing fill material from an alternate borrow site (eg. overburden from the adjacent quarry), and/or sourcing pavement material from an adjacent quarry or from a quarry at Exeter, is not assessed by this REF.

- Reduction in the visual amenity of the Proposal site on the Hume Highway during construction.

Safeguards detailed in Section 10.1 of this REF would be implemented to mitigate the identified impacts of the Proposal.

9.17 Operational Hazards and Risks

Potential Impacts

Improvements in the horizontal and vertical alignment of the roadway would reduce the risk and the degree of operational spills and accidents anticipated as a result of the Proposal. The Proposal would not cause a change in the potential for degradation of the surrounding environment due to littering. In the short term (during establishment of revegetation works), the Proposal would reduce the potential for fire caused by inappropriate disposal of cigarette butts. In the long term (following establishment of revegetation works), the Proposal would not increase the potential for fire caused by inappropriate disposal of cigarette butts.

Site specific Safeguards

No site specific safeguards are proposed to address the above potential impacts.

9.18 Principles of Ecologically Sustainable Development

The National Strategy for Ecologically Sustainable Development (NSESD) has been formulated to ensure ESD is accounted for in all Proposals. There are three core objectives:

- To enhance individuals' and community well-being and welfare by following a path of economic development that safeguards the welfare of future generations;
- To provide for equity within and between generations; and
- To protect biological diversity and maintain essential ecological processes and life-support systems.

These objectives are complemented with a number of guiding principles that are considered below in Table 9.17 in terms of the Proposal.

Table 9.17: Principles of ESD Applied to the Proposal

Principle	Application to the Proposal
Precautionary Principle	Design aspects of the Proposal have considered potential hazards and risks resulting from both construction and operation of the Proposal. No issues have been identified that would cause any serious or irreversible environmental damage as a result of the Proposal at this location. The introduction of site specific safeguards as outlined in Section 10 of this REF would ameliorate potential environmental impacts.
Intergenerational Equity	The Proposal would improve the level of supporting infrastructure required for the Hume Highway, and make provision for a more efficient and safer transport corridor for use by future generations. Concurrently, the Proposal considers and minimises impacts to the local environment through the introduction of site specific safeguards to ensure the integrity of natural and social values of the environment for future generations.

Conservation of Biological Diversity & Ecological Integrity	Thorough assessment of the local environment has been undertaken to identify and manage any potential environmental hazards or risks associated with the Proposal. site specific safeguards outlined in Section 10 of this REF would ensure that the Proposal does not compromise biological diversity or ecological integrity.
Improved Valuation & Pricing of Environmental Resources	It is often difficult to place a monetary value on environmental resources. An indirect indication of the value of such resources is the cost of the proposed site specific safeguards. The costs of the proposed site specific safeguards would be calculated once design of the road is finalised.

9.19 Matters of National Environmental Significance (NES) and Commonwealth Land

The Commonwealth *Environment Protection and Biodiversity Act 1999* (EPBC Act) requires that the following factors must be considered:

Matters of National Environmental Significance

- **World Heritage Properties:** None Found within 10km of the Proposal site.
- **National Heritage Properties:** None Found within 10km of the Proposal site.
- **Wetlands of International Importance:** The Proposal site is not in the vicinity of any wetlands of international significance.
- **Commonwealth Listed Threatened Species and Ecological Communities:** There are no Threatened Ecological Communities and 13 listed threatened species potentially occurring in the vicinity of the proposed works (Refer to Section 9.6 for discussion of impacts on threatened species).
- **Commonwealth Listed Migratory Species:** There are seven migratory species potentially occurring within 10km of the Proposal site.
- **Nuclear Actions:** The Proposal would not involve a nuclear action.
- **Commonwealth Marine Areas:** None Found within 10km of the Proposal site.

Other Factors

- **Commonwealth Land:** There are no Commonwealth reserves listed within 10km of the Proposal site.
- **Regional Forest Agreements:** There are no Regional Forest Agreement areas listed within 10km of the Proposal site.
- **Conservation Reserves:** The Proposal site is not within 10km of any State and Territory Reserves.

9.20 Assistance to Assessing Officer

9.20.1 Summary of Beneficial Effects

The beneficial effects resultant from the construction of the Proposal include:

- Improved travel efficiency and safety for the Hume Highway following completion of realignment works; and
- Improved vertical and horizontal alignment and sight distances of the Hume Highway northbound carriageway.

9.20.2 Summary of Adverse Effects

The Proposal would result in some adverse effects, which would include:

- Temporary increases in dust emissions during construction;
- Short term disruption to traffic flows during construction;
- Increased truck movements during construction;
- Short term loss of vegetation and fauna habitat;
- Short term potential for sedimentation of local waterways as a result of construction activities; and
- Short term socio-economic impacts (visual and dust).

The majority of adverse effects would be of temporary nature only, and the impacts would be managed during the construction period in accordance with the CEMP and/or PEMP.

10 Implementation Stage

10.1 Summary of Proposed Safeguards

Site specific safeguards outlined in this document would be incorporated into the detailed design phase of the Proposal and during construction and operation of the Proposal. These safeguards would minimise any potential adverse impacts arising from the proposed works on the surrounding environment. All safeguards described in this REF and the Decision Report/Conditions of Approval would be incorporated into the Contractor's Environmental Management Plan (CEMP) and/or the Project Environmental Management Plan (PEMP).

The CEMP and PEMP (if required) would be developed in accordance with the specifications set out in the RTA's Environmental Protection (Management Plan) – QA Specification G36, G38, G40 and QA R178.

Climate	• Works would not be undertaken during periods of heavy rainfall; and • In the event of heavy rain, works would be delayed until such time as the weather has satisfactorily settled.
Air Quality	• Construction truck movements would be controlled on site by being restricted to designated routes; • When dust is visually detected, the frequency of watering would be increased. Where possible, dust generating activities would be reprogrammed to avoid periods of high wind velocity; • If winds are high and works are creating high levels of dust that are likely to cause discomfort to local residents or a safety hazard to traffic or work personnel, the works would be modified or stopped until the dust hazard is eliminated or has been reduced to an acceptable level; • Truck loads would be wet down or covered as necessary to suppress dust generation; • Tailgates would be secured during operation of trucks and utes; • There would be no burning of timber or wastes; • Disturbed surfaces would be revegetated progressively during construction of the Proposal; and • Machinery would be turned off, rather than left idling for long periods.
Landform, Geology and Soils	• An erosion and sedimentation control plan would be developed and incorporated into the CEMP. The plan would incorporate specifications outlined in the <i>NSW Erosion and Sediment Control Handbook No. 2</i>, identify areas requiring management controls, include inspections and checklist sheets and be reviewed by the RTA's Regional Environmental Adviser, Southern Region prior to the commencement of works;

Water Quality and
Hydrology

- All stockpiles sites would be designed, established, operated and decommissioned in accordance with the RTA's *Stockpile Management Procedures 2001*;
- Stockpiles would not be established on slopes greater than 2:1 (horizontal to vertical);
- Stockpiled materials would be stored away from drainage lines;
- The stockpiling of surplus material would not be undertaken during heavy periods of rainfall;
- Batters would be stabilised with local native grasses (and/or sterile exotic grasses) and local native shrubs;
- If greater than 30,000m³ of fill material is extracted, stored or stockpiled within a twelve month period, the RTA would be required to obtain an environmental protection licence ("Licence") under the POEO Act;
- At sites where obsolete drainage structures (chainages 146507, 146950, 147020, 147500 and 147520) are removed, the disturbed ground would be rehabilitated to match the local landform; and
- In accordance with RTA's *Stockpile Site Management Procedures 2001*, the site compound/stockpile sites would be located in flat areas more than 50m from waterways, and not within flood liable land.
- The Proposal would be undertaken in accordance with RTA's *Water Policy* and *Code of Practice for Water Management*;
- Should any spillage occur during construction the RTA's Regional Environmental Adviser, Southern Region, would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of in accordance with DEC requirements;
- An incident emergency spill plan would be developed and incorporated in the CEMP. This would include measures to avoid spillages of fuels, chemicals, and fluids onto the floodplain and/or into any waterways. All personnel would be made aware of these measures. An emergency spill kit would be kept onsite at all times;
- No construction or operational water would be permitted to be discharged to "quarry" land located to the north of the Proposal site;
- If the disposal or application of recycled water would directly affect a waterway, a 'licence to pollute' under the POEO Act waterways would be required;
- Recycled water would only be drawn from an environmental discharge (or draw point) licensed by the DEC;
- Recycled water to be used by the Proposal would need to meet the 'Minimum Water Quality Requirements for Recycled

Water (Uncontrolled Access)' specified in Tables 1 and 2 of the *RTA's DRAFT Discussion Paper: The Viability of Using Recycled Water at RTA Project Sites on a Statewide Basis 2004*;

- Written certification would need to be acquired from the sewage treatment plant (STP), stating that the recycled water being provided by the STP is equal to the water quality standard requested by the RTA;
- Use of recycled water would need to be undertaken in accordance with the 'Work Practices' outlined in *RTA's DRAFT Discussion Paper: The Viability of Using Recycled Water at RTA Project Sites on a Statewide Basis 2004*;
- The RTA's Regional Environmental Adviser, Southern Region, would need to approve the use of recycled water prior to collection (and application to land) of the recycled water;
- Any material transported onto pavement surfaces would be swept and removed regularly and at the end of each working day;
- Regular maintenance and checking of the sediment controls would be undertaken (at least every week and after a major rainfall event) and records kept. Sediment would be cleared from behind barriers on a regular basis;
- Within the Proposal site, compacted hard stand surfaces would be established at entry/exit points which connect the proposed realignment route to the existing Hume Highway;
- Should water for the Proposal need to be drawn from any waterways and used, a licence under Section 10, or a permit under Section 18F of the *Water Act, 1912* may be required from DIPNR. In addition, the RTA's Regional Environmental Adviser, Southern Region, would be advised of the location and methodology in which water would be drawn;
- If water is sourced from farm dams, water would only be sourced from properties that comply with their harvestable right. Note: Under the DIPNR *Farm Dams Policy (1999)*, landholders have a right to a portion (10%) of the runoff from their property without needing a licence. This is known as the 'harvestable right' (DIPNR 1999);
- Appropriate sediment controls would be installed adjacent to drainage lines to separate clean and dirty water, and to filter dirty water prior to discharge to drainage lines;
- All sedimentation control structures would be removed only after adequate stabilisation of disturbed surfaces is achieved;
- New culverts would be positioned to ensure that water discharges do not cause backwaters and/or erosion and sedimentation problems;
- Culverts would be designed and constructed in such a way as to minimise disturbance to any waterways and in accordance

with *NSW Government's Flood Policy 1984*, and in the *NSW Government's Floodplain Management Manual 2001*;

- Any wastewater generated from construction processes would be contained onsite and/or treated to a DEC certified process prior to its disposal. The release of dirty water into waterways would be prohibited;
- All concrete works would be undertaken in accordance with the EPA *Environmental Best Management Practice Guideline for Concreting Contractors (2002)*;
- Vehicle washdowns and/or cement washouts would be undertaken within a designated bunded area with an impervious surface or undertaken off site; and
- No temporary or permanent sedimentation basin is proposed to be constructed for the Proposal. Should it at any stage, be required to do so, the RTA's Regional Environmental Adviser, Southern Region would be contacted and consulted and an additional impact assessment undertaken.

Biodiversity

- All topsoil disturbed by the Proposal would be stripped and stockpiled within the Proposal site for later reuse in rehabilitation works;
- In accordance with RTA's *Stockpile Site Management Procedures 2001*, the site compound/stockpile sites would be located within areas which are already disturbed and do not require clearing of native vegetation;
- Hollow bearing trees located within the Proposal site would be retained where possible;
- Where possible, removal of hollow bearing trees would be conducted outside of the breeding season (August – December) to limit potential impacts on fauna;
- Where possible, removal of hollow bearing trees would be conducted outside the cooler months (June, July) when bat species may be in torpor;
- To provide habitat features for native fauna, large trees (particularly those containing small hollows) would be removed relatively intact and placed on the ground in bushland areas to be retained within the road corridor and beyond clear zones (where possible);
- Tree-hollows present in trees to be cleared would be inspected immediately prior to clearing. Where native fauna are found, the trees would be removed at dusk (if practical), and the native fauna would be relocated to nearby suitable habitat. If native fauna are injured, these would be transferred to the care of WIRES or other local animal rescue network;
- Rather than removing whole trees, lopping of tree branches would be undertaken where possible to retain fauna habitat;

- If a substantial time period elapses prior to commencement of proposed works (ie. 6 months), additional targeted surveys would be conducted for the Striped Legless Lizard (*Delma impar*), to ensure that it has not moved into potential habitat present within the Proposal site;
- If Wombats are found in holes during clearing works, they would be relocated to nearby suitable habitat.

be removed and/or destroyed, and disposed of appropriately in accordance with their category under the *Noxious Weeds Act 1993*;

Socio-economic
Considerations
including Landuse

- Any private land (ie. land located outside the road corridor) impacted by the Proposal would be restored to satisfy landowner requirements (ie. to appropriate land contours, soil condition and vegetation cover);
- Revegetation areas would be monitored every two months for the first six months and then every 6 months for two years. Monitoring would assess establishment success, weed abundance, grazing impacts, and any dead plants would be replaced; and
- Should additional vegetation removal be required, the proposed variation to the original scope would be referred to the RTA's Regional Environmental Adviser, Southern Region to determine if any further environmental impact assessment is required.
- Traffic management controls would be implemented during the construction period and traffic would use the existing roadway during construction in accordance with a Traffic Management Plan. All temporary traffic control measures would be undertaken in accordance with traffic control plan TCP66 in RTA's *Traffic Control at Work Sites manual* and RTA's QA Specification G10 *Control Of Traffic*;
- Northbound access along the Hume Highway would be maintained during construction of the Proposal;
- Access between the Hume Highway, Tiyces Lane and the quarry would be maintained during construction and operation of the Proposal;
- Access onto and along the construction site would be monitored and restricted in order to limit the potential damage upon neighbouring property and vegetation;
- Temporary access would be provided as necessary, in order to minimise any potential disruption to traffic, and designed in such a way to ensure that the safety of motorists using the Hume Highway is paramount;
- Adequate signage and safety barriers would be erected to inform and alert motorists to the presence of changed traffic conditions, and the existence of traffic hazards and construction traffic in the area;
- The quarry owners would be consulted regarding their access requirements;
- Notifying all local residents of any potential disruptions that they may encounter, regarding access and traffic flows during the construction of the Proposal; and
- Traffic management measures would be implemented to manage traffic during connections of the new roadworks with the existing Hume Highway.

- | | |
|------------------------------------|--|
| Indigenous Heritage | <ul style="list-style-type: none"> • In the event that any indigenous objects are located during the works, all work would cease in the vicinity of the find, and the RTA's Regional Environmental Adviser Southern Region, RTA's Aboriginal Programs Consultant Southern Region, and NSW DEC would be contacted; and • The RTA's Property Group would be consulted prior to the commencement of works to determine if the Proposal site is located within the southern section of 'Register of Native Title Claims' (No. NC97/007). |
| Non-Indigenous Heritage | <ul style="list-style-type: none"> • In the event that any non-indigenous relics are located during the works, all work would cease in the vicinity of the find, and the RTA's Regional Environmental Adviser, Southern Region would be contacted. |
| Visual, Landscape and Urban Design | <ul style="list-style-type: none"> • Following completion of construction activities, the Proposal site would be subject to comprehensive revegetation which would be undertaken to reduce the visual impact of the new carriageway. Revegetation works would be concentrated at the following locations: <ul style="list-style-type: none"> ➤ All vegetated areas disturbed by the construction works; ➤ New road embankments/batters; ➤ Within the median between the two carriageways; and ➤ Along the bypassed sections of the existing northbound carriageway. • Revegetation works would utilise local native species specified in the ecology report (see Appendix A); and • A revegetation plan would be prepared for the Proposal, and would be reviewed by the RTA's Regional Environmental Adviser, Southern Region prior to commencement of revegetation works. |
| Noise and Vibration | <ul style="list-style-type: none"> • Should works be required outside standard working hours, the procedures contained in the RTA's <i>Environmental Noise Manual 2001</i>, "Practice Notes vii – Roadworks Outside of Normal Working Hours" would be followed; • The two nearby residents (at 430m south of the Hume Highway adjacent to Tiyces Lane, and 500m south east of the eastern end of the Proposal site) would be contacted prior to the commencement of works via letter box drop, or door knock and would be informed of the proposed works, working hours, and period of construction. Residents would also be provided with a contact name and number should any complaints wish to be registered; • In accordance with RTA's <i>Stockpile Site Management Procedures 2001</i>, the site compound/stockpile sites would be located more than 250m from residents or other activities |

	that may be affected by operational noise or other impacts of the site;
	• The idling of machinery and equipment for a prolonged period of time would be avoided where possible; and • Best management practices would be adopted that are consistent with the RTA's <i>Environmental Noise Manual 2001</i>.
Contaminated Land	• Should any spillage occur during the construction activity the RTA's Regional Environmental Adviser, Southern Region would be contacted immediately, and contaminants would be immediately contained, removed, treated (if necessary) and disposed of in accordance with DEC requirements; • Any accidental spills would be managed in accordance with the RTA's <i>Emergency and Incident Response Procedure</i>; • Any contaminated waste found would be identified and classified by a suitably qualified consultant; and • Any contaminated waste identified or generated during the works would be disposed of in accordance with DEC guidelines.
Waste Minimisation and Management	• The Resource Management Hierarchy principles of the WARR Act would be adopted. They are as follows: ➤ Avoid unnecessary resource consumption as a priority; ➤ Avoidance is followed by resource recovery (including reuse of materials, reprocessing recycling, and energy recovery); and ➤ Disposal is undertaken as a last resort; • Waste material generated (ie. bitumen, concrete, cleared vegetation, excess cut material, hydrocarbons, water, garbage and sewage) would be reused or recycled where possible; • A Waste Management Plan would be prepared in accordance with RTA's QA Specifications and in accordance with RTA's <i>Waste Minimisation & Management Guidelines, 1998</i> and the principles of the WARR Act; • Trees to be removed (ie. not reused/retained within the Proposal site) would be assessed for their value as millable timber; • All noxious weeds and exotic plant species removed would be bagged and disposed of at a licenced landfill facility; • All construction materials, surplus soils and wastes generated from the Proposal would be stockpiled and stored at nominated stockpile sites prior to reuse, recycling or disposal; • All working areas would be maintained, kept free of rubbish and cleaned up at the end of each working day; • The demolition of any existing structure would be undertaken in accordance with RTA's QA Specification B314;

Associated
Infrastructure and
Activities

- Any excess recycled water would be disposed of at a suitable location (ie. STP) in accordance with DEC requirements;
- Wastes would not be stored for long periods during construction of the Proposal. Empty drums of fuels, oils or chemicals and fluids would not be stored on site during construction.
- It is recommended that the "dial before you dig" hotline be contacted prior to commencement of works.

11 Consideration of Environmental Factors

11.1 Clause 228 Checklist (NSW Legislation)

Factor	Impact
a) <i>Any environmental impact on a community?</i> Comments: The Proposal is expected to have a positive impact on the community in the long term through the provision of improved road safety. Adverse environmental impacts on a community from construction works (dust and noise) are not expected, as the closest residences are located 430m and 500m away from the Proposal site (refer to Section 9.7 of this REF).	Long term positive
b) <i>Any transformation of a locality?</i> Comments: The Proposal would have short-term negative impacts on the locality as a result of clearing of 3ha of native vegetation within the median. Site specific safeguards detailed in Section 10, including revegetation, have been proposed to reduce the identified impacts of the Proposal on the locality (refer to Section 9.6 of this REF).	Short term negative
c) <i>Any environmental impact on the ecosystems of the locality?</i> Comments: The Proposal would remove 3ha of native vegetation (with no unique flora features or species) within the median. Noxious weeds present within the Proposal site would be removed.	Short term negative
The Proposal would not introduce any new barriers to fauna movements within or across the Proposal site. In the short term, the Proposal would remove open woodland habitat (with some small tree-hollows) for birds, bats, wombats, macropods and reptiles. The implementation of revegetation of disturbed areas following construction, would ensure these impacts are minimised and short term only.	Short term negative
Noise and vibration of construction machinery would cause mobile and disturbance-tolerant native fauna (eg. birds and bats), and wombats, macropods and reptiles to move away from the Proposal site. These fauna species would be expected to return to the Proposal site following establishment of revegetation works. Fauna such as birds, bats, wombats, macropods and reptiles would be able to utilise similar habitat in the woodland located to the north and south of the Proposal site (refer to Section 9.6 of this REF).	

Factor	Impact
d) <i>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality?</i> Comments: The Proposal would have short-term negative impacts on the aesthetics of the Proposal site as a result of vegetation clearing. The proposed revegetation works would reduce the negative visual impacts in the long term. In the long-term there would be no reduction of the aesthetic, scientific quality, environmental quality or value of a locality (refer to Section 9.7 of this REF).	Short term negative Long term neutral
e) <i>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations?</i> Comments: No impacts on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations are expected providing the site specific safeguards specified in Section 10 are implemented (refer to Sections 9.8 and 9.9 of this REF).	Nil
f) <i>Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act 1974)?</i> Comments: The Proposal would not introduce any new barriers to fauna movements within or across the Proposal site. Short term impacts on fauna would result from the removal of 3ha of open woodland habitat (with some small tree-hollows) for birds, bats, wombats, macropods and reptiles. The implementation of revegetation of disturbed areas following construction, would ensure these impacts are minimised and short term only. Fauna such as birds, bats, wombats, macropods and reptiles would be able to utilise similar habitat in the woodland located to the north and south of the Proposal site. Noise and vibration of construction machinery would cause mobile and disturbance-tolerant native fauna (eg. birds and bats), and wombats, macropods and reptiles to move away from the Proposal site. These fauna species would be expected to return to the Proposal site following establishment of revegetation works (refer to Section 9.6 of this REF).	Short term negative
g) <i>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air?</i> Comments: There would be no endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air as a result of the Proposal (refer to Section 9.6 of this REF).	Nil

Factor	Impact
<i>h) Any long-term effects on the environment?</i> Comments: With the implementation of the site specific safeguards outlined in Section 10 (particularly revegetation works), no long-term effects on the environment are expected (refer to Section 9 of this REF).	Nil
<i>i) Any degradation of the quality of the environment?</i> Comments: During construction there is the potential for impacts on flora and fauna, erosion and sedimentation and air. However, the implementation of site specific safeguards, including revegetation, would ensure that these impacts are minimised. These impacts would be minimised through the implementation of site specific safeguards outlined in Section 10 (refer to Sections 9.3, 9.4 and 9.6 of this REF).	Short term negative
<i>j) Any risk to the safety of the environment?</i> Comments: The Proposal is expected to have a positive impact on the safety of the environment through provision of improved road safety. The Proposal would improve travel efficiency and safety for Hume Highway traffic by realigning the northbound carriageway (refer to Section 9.7 of this REF).	Long term positive
<i>k) Any reduction in the range of beneficial uses of the environment?</i> Comments: The Proposal would not result in any reduction in the range of beneficial uses of the environment (refer to Section 9.7 of this REF).	Nil
<i>l) Any pollution of the environment?</i> Comments: There would potentially be some pollution of the environment during the construction phase due to impacts from the following: dust, erosion, release of water and wastes (eg. oil spills) associated with construction works, vehicle washdowns, cement washouts, and from accidental spills of fuels, hydraulic fluid, pavement materials and chemicals. These impacts would be minimised through the implementation of site specific safeguards outlined in Section 10 (refer to Sections 9.4 and 9.5 of this REF).	Short term negative
<i>m) Any environmental problems associated with the disposal of waste?</i> Comments: The Proposal would generate the following waste: bitumen from the obsolete and new roadway, and concrete from obsolete drainage structures; excess road base and cement; cleared vegetation; excess cut material; waste oils and liquids from maintenance of construction plant and equipment; water from vehicle washdowns; and garbage and sewage from site compounds. All waste would be reused, recycled or disposed of at a licensed waste facility (refer to Section 9.13 of this REF).	Short term negative

Factor	Impact
<i>n) Any increased demands on resources, natural or otherwise which are, or are likely to become in short supply?</i> Comments: Water is currently in short supply in the Goulburn area. A total of 1.8ML (approximately 30,000L/day for 12 weeks) of water would be used for earthworks compaction and dust suppression. To reduce demand on water, recycled water (ie. tertiary treated sewage) would be sourced from Goulburn Mulwaree Council in Goulburn. There would be no increased demands on any other resources which are, or are likely to become, in short supply. Recycling would be undertaken wherever possible (refer to Section 9.15 of this REF).	Short term negative
<i>o) Any cumulative environmental effect with other existing or likely future activities?</i> Comments: In the short term, the Proposal in combination with the proposed upgrade of Towrang Road and Carrick Road intersections with the Hume Highway (approximately 500m to the west of the Proposal site), would contribute to minor degradation of the environment through a cumulative loss of biodiversity, and erosion/sedimentation and water quality impacts. In the long term, the Proposal would create a safer and more efficient road environment (refer to Section 9.16 of this REF).	Short term negative

11.2 EPBC Act 1999 (Commonwealth Legislation)

The EPBC Act requires that the following matters of National Environmental Significance (NES) be considered:

Factor	Impact
<i>a) Any environmental impact on a World Heritage property?</i> Comments: There are no world heritage properties within the vicinity of the Proposal.	Nil
<i>b) Any environmental impact on National Heritage places?</i> Comments: The Proposal would not impact on any listed places.	Nil
<i>c) Any environmental impact on wetlands of international importance?</i> Comments: The Proposal would not impact on any wetlands of international importance.	Nil
<i>d) Any environmental impact on Commonwealth listed threatened species or ecological communities?</i> Comments: Thirteen listed threatened species have the potential to occur in the vicinity of the Proposal site. No Commonwealth listed ecological communities are present within the Proposal site. The Proposal is not expected to impact on any Commonwealth listed threatened species or ecological communities. No referral to the Commonwealth Environment Minister would therefore be required.	Nil
<i>e) Any environmental impact on Commonwealth listed migratory species?</i> Comments: No impact on Commonwealth listed migratory species is anticipated as a result of the Proposal.	Nil
<i>f) Does any part of the proposal involve a nuclear action?</i> Comments: The Proposal would not involve a nuclear action.	Nil
<i>g) Any environmental impact on a Commonwealth marine area?</i> Comments: The Proposal would not impact on a Commonwealth marine area.	Nil
<i>In addition; Any impact on Commonwealth Land?</i> Commonwealth land would not be affected, indirectly or directly, as part of this Proposal.	Nil

12 Certification

This Review of Environmental Factors provides a true and fair review of the Proposal in relation to its potential effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the Proposal.



Peter Ryan
Environmental Officer
Date: 13-1-2005

I have examined this Review of Environmental Factors and the certification by Peter Ryan and accept the Review of Environmental Factors on behalf of the RTA.

Jennifer Mak
Project Manager
Date:

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Appendix A Ecological Assessment

PROPOSED RE-ALIGNMENT OF THE HUME HIGHWAY
AT TIYCES LANE, EAST OF GOULBURN

ECOLOGICAL ASSESSMENT – FLORA AND FAUNA

November 2004

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**PROPOSED RE-ALIGNMENT OF THE HUME HIGHWAY,
AT TIYCES LANE, EAST OF GOULBURN**

ECOLOGICAL ASSESSMENT – FLORA AND FAUNA

This assessment has been prepared by:

R Hayes

Rebecca Hayes
BSc (environmental biology) MEngMngt MEIA MECA

30/11/04

Date

SUMMARY

This Ecological Assessment – Flora and Fauna report has been prepared as part of a Review of Environmental Factors (REF) for proposed re-alignment of the Hume Highway at Tiycles Lane, east of Goulburn.

The majority of the study area is located within the median strip between the two existing carriageways of the Hume Highway, and supports a native woodland vegetation community. However, the western end of the study area is predominantly open grassland, and the eastern end of the study area, east of an existing mine, supports only narrow strips of woodland fringing the existing carriageways of the Hume Highway, and then heavily grazed pasture on freehold land to the north and south of the Highway.

No flora or fauna species, populations or communities listed as threatened on either the TSC Act or EPBC Act were recorded during field surveys conducted in the study area.

A variety of threatened fauna species are known to occur in the locality. However, none of these are considered likely to be affected by the proposed works, primarily given the nature of habitats and resources present in the study area in relation to those present on adjacent lands to the north and south.

A Species Impact Statement is not required for the proposed works.

Referral of the proposal to the Commonwealth Minister for Environment and Heritage under the EPBC Act is not required.

The study area does not support 'potential koala habitat' as defined under SEPP 44, therefore SEPP 44 does not apply to the proposed works.

A list of recommendations that should be implemented to minimise impacts of the proposed works upon native flora and fauna is provided in Chapter 8.2 of the report.

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**PROPOSED RE-ALIGNMENT OF THE HUME HIGHWAY
AT TIYCES LANE, EAST OF GOULBURN**

ECOLOGICAL ASSESSMENT – FLORA AND FAUNA

November 2004

1 INTRODUCTION

1.1 Context and Development Proposal

This Ecological Assessment – Flora and Fauna report has been prepared as part of a Review of Environmental Factors (REF) for proposed re-alignment of the Hume Highway at Tiyces Lane, east of Goulburn.

The proposal would re-align approximately 2.2 km of the northbound carriageway of the Hume Highway, reducing the radius of curves to improve safety. The highway would also then run more parallel with the existing southbound carriageway. The new alignment would be located within the median strip of the existing Hume Highway, between the two carriageways.

The proposed re-alignment would be constructed in two stages:

- Stage 1 would re-align approximately 1km of the highway, this being the central section of the proposed re-alignment, including the Tiyces Lane intersection; and
- Stage 2 would re-align approximately 0.6 km of the highway from the eastern end of Stage 1, and approximately 0.9 km of the highway from the western end of Stage 1.

1.2 Study Area

The study area for this report extends for 2.2 km along the Hume Highway, centered approximately on the Tiyces Lane intersection, and extending up to 50m north and south of the proposed development footprint. The study area is approximately 25 hectares in size. Refer to Figure 1.

The majority of the study area is located within the median strip between the two existing carriageways of the Hume Highway, and supports a native woodland vegetation community. However, the western end of the study area is predominantly open grassland, and the eastern end of the study area, east of the existing mine site, supports only narrow strips of woodland fringing the existing carriageways of the Hume Highway, and then heavily grazed pasture on freehold land to the north and south of the Highway.



FIGURE 1

Aerial photo illustrating the extent of native vegetation present within the study area in relation to surrounding lands. Study area illustrated by black outline.

1.3 Objectives

The objectives of this investigation and report are:

- to identify and describe the existing ecology (flora and fauna) of the study area;
- to determine whether threatened flora or fauna species, populations or ecological communities (as listed on the *NSW Threatened Species Conservation Act 1995* or on the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999*) occur in the study area, are likely to occur in the study area, or are likely to be affected by the proposed works;
- to assess the significance of likely impacts of the proposed works upon threatened biota, pursuant to Section 5A of the *NSW Environmental Planning & Assessment Act 1979* (EP&A Act), as modified by the *NSW Threatened Species Conservation Act 1995* ('eight-part test');
- to assess the study area in relation to State Environmental Planning Policy No. 44 – Koala Habitat;
- to consider whether the proposal should be referred to the Commonwealth Minister for Environment & Heritage under the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999*; and
- to consider appropriate impact amelioration and environmental protection measures which should be implemented in the study area, to minimise the potential impacts of the proposed works on the natural ecology of the area.

2 FIELD SURVEYS AND RESEARCH

2.1 Research

Relevant data (including records of threatened species) were obtained from previous knowledge of the area, from a search of records listed within 10km of the site on the NSW National Parks & Wildlife Service (NPWS) Atlas of NSW Wildlife (data obtained September 2004), and from a search of Environment Australia's EPBC on-line database (data obtained October 2004).

Liaison with Environment and Planning staff from Greater Argyle Shire Council did not result in any additional information with respect to native fauna in the vicinity of the study area. No local interest groups are known to have an interest in the fauna of the study area.

Threatened species, populations and ecological communities known to occur within 5km of the study area are listed in Table 3 later in this report. Table 3 also provides known details of habits, habitat and foraging requirements, and distributions of these species.

2.2 Flora

Detailed botanical surveys were conducted throughout the study area on the 17th and 20th of September 2004. Specific searches were conducted with reference to the Random Meander

technique (Cropper 1993) for relevant plant species of conservation significance known to occur in the locality (relevant databases, previous investigations), or anticipated to occur in the study area.

Plant identifications conform to nomenclature in Harden (1990-1993) and to recent reclassifications and name changes listed in *Cunninghamia* and *Telopea*. An inventory was compiled of all plant species recorded (Appendix 1).

Native vegetation was surveyed and assessed according to the structural classifications detailed in Specht (1970). Ecological communities were identified and described with reference to the descriptions included in the Final Determinations of communities listed on the *NSW Threatened Species Conservation Act 1995* (TSC Act) and the *Commonwealth Environment Protection & Biodiversity Conservation Act 1999* (EPBC Act).

The conservation significance of species, populations and ecological communities recorded during the survey was established with reference to the EPBC Act in the national context, and to the TSC Act in the state context.

2.3 Fauna

A general fauna survey including habitat evaluation was conducted throughout the study area on the 11th and 15th of October 2004.

The survey involved observations of animal activity, habitat surveys and searches for indirect evidence of fauna (such as nests, scats, tracks and scratchings). Specific searches were conducted for habitat or resources of relevance for threatened fauna species known from the general locality (relevant databases, previous investigations), or which might be anticipated to occur on the site.

Specific bird surveys were conducted throughout all habitat types present in the study area, and involved both visual and aural detection of species (Table 1). Specific reptile searches involved the turning of rocks, logs and other debris, and scratching amongst leaf litter at the base of trees (Table 1).

Diurnal mammal and amphibian surveys were conducted throughout the study area in areas of potential or relevant habitat, where present (Table 1). An emphasis was placed on searches for scats, tracks and scratchings, and other indirect signs, and for aural detection of amphibians. Targeted amphibian surveys extended into the late afternoon and evening, in areas of potential habitat (Table 1).

Spotlighting surveys were conducted throughout the study area (Table 1), to target nocturnal birds (such as owls), nocturnal mammals (such as possums and gliders), and amphibians.

An Anabat II Bat Detector could not be used during the surveys due to difficulties resulting from highway noise, strong winds and some rain during the survey period. It is assumed that microchiropteran bat species known to occur in the locality would utilise the study area on occasions.

Opportunistic records of all fauna species were maintained throughout the survey period, and an inventory compiled to include all species detected (Appendix 1). The conservation significance of native fauna recorded during the survey or expected to occur was established with reference to the EPBC Act in the national context, and to the TSC Act in the state context.

Weather conditions during the fauna survey are described in Table 2 below.

Table 1 Fauna Survey Effort

Date	Method	Target Fauna
11 th October 2004	Targeted mid-morning and afternoon surveys (10 person-hours), and evening spotlighting (4 person-hours)	Birds, reptiles, amphibians, mammals, general habitat observation and recording, searches for scats and other indirect evidence
15 th October 2004	Targeted late afternoon survey (1.5 person-hours) and evening spotlighting survey (3 person-hours)	Birds, reptiles, amphibians, mammals, searches for scats and other indirect evidence

Table 2 Weather Conditions during the Fauna Survey Period

Date	Time	Weather
11 th October 2004	Morning	Mild, partly overcast, gentle breeze.
	Afternoon/Evening	Cool change, increasing cloud and occasional light rain
15 th October 2004	Afternoon/Evening	Cool, mostly clear and sunny, strong southerly winds

2.4 Survey Limitations

Pasture grass species present in the study area, particularly to the east of the existing mine site, were not able to be identified due to their desiccated condition and due to being grazed almost to ground level.

The field surveys were conducted in early spring, whilst weather conditions in the Goulburn region were still cool. It is likely that some fauna species would still be relatively inactive during this time and would not be easily detected. To compensate for this, assessment of the proposed works was based largely on species records contained on databases, evaluation of habitats present in the study area, and indirect evidence for fauna.

Some rain periods occurring during the evening of the first survey day, and strong winds were encountered on the second survey day. These conditions would have affected the range of fauna species recorded.

The noise generated from the Hume Highway limited the success of aural detection of more cryptic and quieter birds. It was also not possible to detect bats using an ultrasonic call detector. In this regard, threatened species known to occur in the locality are assumed to also utilise the study area on occasions, in accordance with a precautionary approach.

3 EXISTING ENVIRONMENT

3.1 General Description

The study area is a narrow corridor approximately 2.2 km long by 100m wide, centered on the proposed new alignment of the northbound carriageway of the Hume Highway.

The whole of the study area has been previously disturbed by road works and maintenance, with access tracks for cable laying and services networked throughout. A fair amount of rubbish has collected in the vegetation in some parts of the study area.

The majority of the study area supports a native woodland community which is likely to be regrowth from after the construction of the highway. The woodland trees are generally juvenile to semi-mature and most are in poor condition at least partially due to the current drought.

The woodland understorey is very sparse, with scattered shrubs, and the ground appears to be very dry, compacted and in some areas stony.

The western end of the study area supports a grassy woodland which becomes more of an open-woodland to woodland in the higher elevations between Tiyces Lane and the existing mine. The eastern end of the study area supports only narrow strips of native trees, fragmented by the highway, adjacent access tracks, clearing and heavily grazed pasture.

There are no creeklines or permanent water within the study area, and no features such as caves or rock outcrops.

3.2 Flora

3.2.1 Details

The vegetation present throughout the study area is a fairly uniform woodland community.

Dominant canopy species present include Brittle Gum *Eucalyptus mannifera* ssp *mannifera*, Yellow Box *Eucalyptus melliodora* and Argyle Apple *Eucalyptus cinerea* in the central part of the study area, with Scribbly Gum *Eucalyptus rossii* also occurring in the grassy woodland areas in the western part of the study area, and Silvertop Ash *Eucalyptus sieberi* becoming dominant in the eastern part of the study area. The canopy has approximately 45% cover, and reaches up to 10-15m in height.

The shrub layer throughout the study area is very sparse, consisting mainly of scattered shrubs of wattles, Proteaceae, Faboideae and Epacridaceae. These plants are present throughout the study area. Many of the wattles and the Grevillea would have been planted as part of the revegetation works following construction of the highway. Wattles were the dominant shrub-layer species throughout the study area. The shrub layer varies from 0-55% cover and reaches up to 1.5-2m in height.

The groundcover throughout the study area varies from relatively deep accumulations of leaf litter, to 100% grasses. With the exception of occasional random patches where *Lomandra* spp and Kangaroo Grass *Themeda australis* dominate, no grass species appeared to dominate in any one area. Pasture grasses could not be identified due to their desiccated condition, and that they had been eaten down to soil level.

3.2.2 Conservation Significance

No plant species listed as a 'threatened species' under either the TSC Act or the EPBC Act were recorded within the study area.

No plant species being part of any relevant 'endangered population' listed under the TSC Act were recorded within the study area.

The vegetation present within the study area does not meet the description for any threatened 'ecological community' listed under either the TSC Act or the EPBC Act.

No Rare or Threatened Plant Species (ROTAP's) as listed in Briggs & Leigh (1996) were recorded in the study area during the field surveys.

Five noxious weeds listed under the NSW Noxious Weeds Act 1993 for the Mulwaree LGA were recorded within the study area – *Cassinia arcuata*, *Senecio madagascariensis*, *Rosa rubiginosa*, *Rubus fruticosus* species aggregate and *Eragrostis curvula* (refer to Appendix 1, weed category controls are provided at the end of the species list table).

3.3 Fauna

3.3.1 Fauna Habitats

Fauna habitat features and resources present within the study area include:

- areas of disturbed open woodland with a variety of canopy tree species provide potential foraging resources at different times of year, of value for parrots and honeyeaters;
- an open canopy of trees adjacent to areas of grassland/pasture provides a potential roosting resource for some raptors and large insectivorous birds;
- some small tree-hollows provide potential shelter and nesting opportunities for microchiropteran bats and small hollow-dwelling birds (refer to Figure 2). No medium or large tree-hollows were recorded in the study area. The trees are generally too young to provide such features;
- deep accumulations of leaf litter in some areas provide a potential shelter and foraging resource for some smaller species of reptile; and
- some areas of dry stony ground also provide potential shelter for invertebrates and small reptiles.

No dens, nests, obvious fauna trails or other evidence of native fauna occupying the study area were recorded during the field surveys. The study area does not contain areas of permanent water, caves, rock outcrops, or other important features for native fauna.

The eastern end of the study area consists only of narrow strips of woodland and single rows of trees which are fragmented by existing road pavement and access tracks. These areas are surrounded to the north, south and east by cleared open pasture, and are of little value for any but the most mobile and disturbance-tolerant of native fauna.

The whole of the study area is considerably affected by noise and other disturbances associated with the existing Hume Highway. Only the more disturbance-tolerant fauna species would be expected to occur within the study area. Most native fauna would prefer the extensive areas of native vegetation which are located to the south and particularly to the north of the study area (see Figure 1).

It appears that the highway currently provides a significant barrier to fauna movements. No regular tracks were observed leading to the highway, nor marks on trees. There are no culverts of value within the study area. No creeklines pass under the highway in the study area.

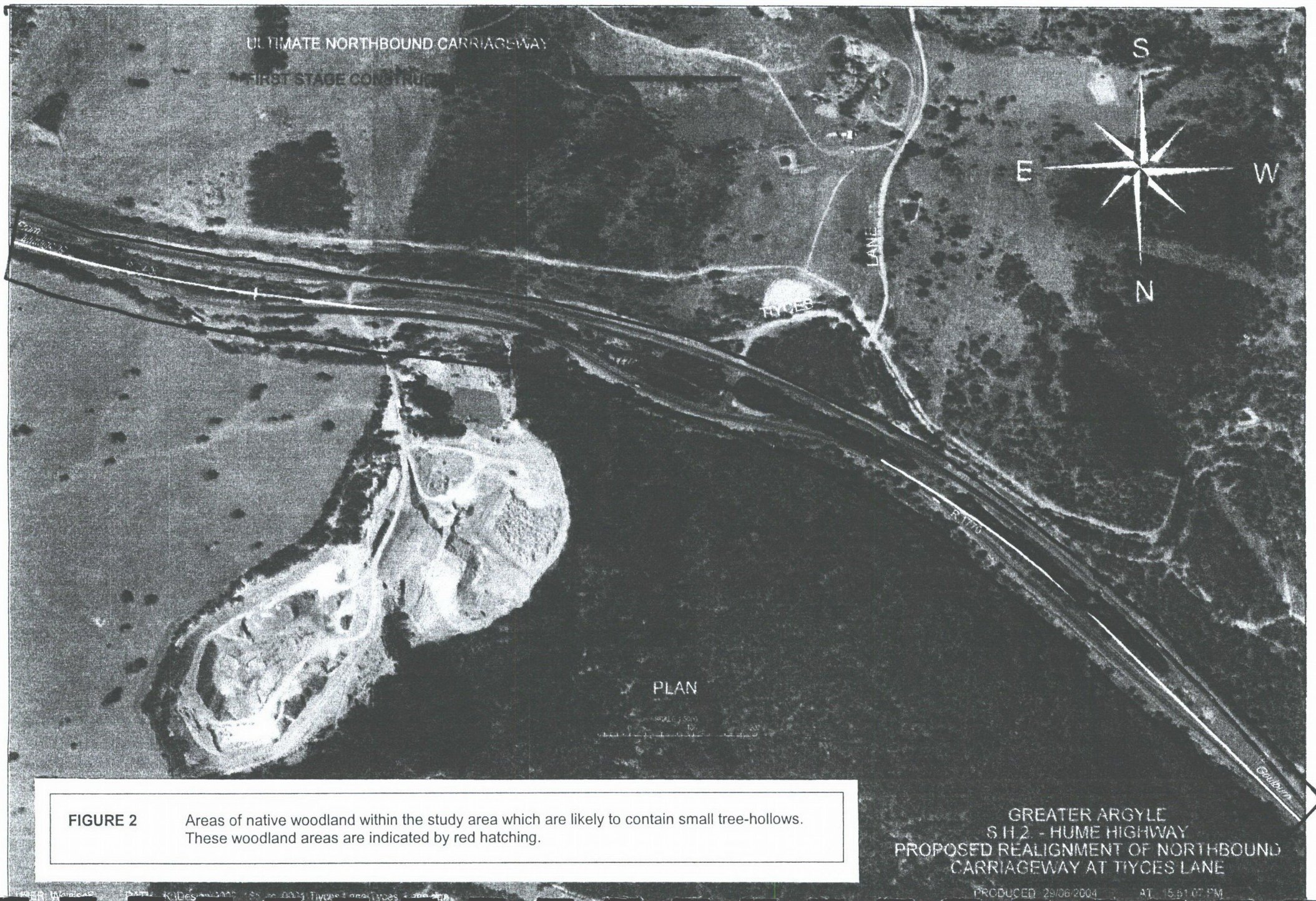


FIGURE 2 Areas of native woodland within the study area which are likely to contain small tree-hollows. These woodland areas are indicated by red hatching.

3.3.2 Fauna Details

Fauna recorded in the study area were mainly the dominant and disturbance-tolerant insectivorous birds such as the Australian Magpie, Australian Raven and Laughing Kookaburra. The Crested Pigeon was recorded foraging on the ground in pasture areas adjacent to the highway. Several small passerine birds (eg fairy-wrens, thornbills) appeared to be calling from woodland to the north of the study area, more distant from the highway than the study area. These species could not be easily identified due to noise from the highway, and moderate windy conditions.

Two small skink species were recorded during the surveys, and it is likely that other small skinks and lizards would also occur in the study area.

No amphibian species were recorded during the surveys, and none are likely to occur due to the lack of permanent water, and the very dry nature of the understorey at the present time. Common and more mobile amphibians may occur on the study area during wetter seasons.

Native mammals recorded in the study area include common terrestrial species such as the Common Wombat, Swamp Wallaby and Eastern Grey Kangaroo. Introduced mammals recorded include the Rabbit and Fox.

No arboreal mammals, nor evidence for such species, were recorded in the study area. These species would not be expected to occur in such close proximity to the highway, given that extensive tracts of native woodland occur on adjacent lands to the north and south. The highway appears to currently provide a significant barrier to movement of these species as no evidence for their movement across the highway was recorded (eg scratches on trees, landing pads of gliders, bones on the ground).

No microchiropteran bat activity was observed during the evening surveys. However, microchiropteran bat species known to occur in the locality would be expected to move through the study area on occasions. The study area is not likely to be of particular value given the degraded nature of vegetation present, and its proximity to the noise and disturbance of the Hume Highway.

3.3.3 Conservation Significance

No fauna species listed as *threatened* under either the TSC Act or EPBC Act were recorded during the surveys. Table 3 below discusses the threatened species known to occur in the locality (NPWS Wildlife Atlas), or likely to occur in the locality (EPBC database), and their potential relevance to the study area.

Table 3 Relevance of threatened species known to occur within 10km of the study area, or considered likely to occur within 10km of the study area (NPWS Atlas, EPBC database).

Species	Habits/Requirements	Relevance to Study Area
Swift Parrot <i>Lathamus discolor</i> E (TSC) E (EPBC)	Breeds only in Tasmania, inhabits eucalypt forest and woodland, forages in the upper tree canopy (Lindsey 1992, Blakers <i>et al</i> 1984)	Not listed within 10km on NPWS Atlas. Study area is limited in extent and is substantially disturbed. Not likely to utilise vegetation present in the median of the existing highway given that extensive areas of similar less disturbed potential foraging habitat occur on adjacent lands to the north and south of the study area. Not likely to be affected by proposed works.

Table 3 cont Relevance of threatened species known to occur within 10km of the study area, or considered likely to occur within 10km of the study area (NPWS Atlas, EPBC database).

Species	Habits/Requirements	Relevance to Study Area
Australian Painted Snipe <i>Rostratula australis</i> V (TSC) V (EPBC)	Inhabits swampy vegetation bordering tropical and warm temperate shallow freshwater wetlands (Lindsey 1992; NPWS 1999). In Australia it is most numerous in the Murray-Darling basin and interior south-east (Lindsey 1992; NPWS 1999).	Not listed within 10km on NPWS Atlas. The study area does not provide potential habitat for this species. Not likely to occur within the study area nor likely to be affected by the proposed works.
Regent Honeyeater <i>Xanthomyza phrygia</i> E (TSC) E (EPBC)	Semi-nomadic, usually recorded on western slopes of Great Dividing Range, in open eucalypt forest and woodland, forages in the upper canopy of flowering eucalypts (NPWS 1999). Usually recorded in box-ironbark associations, and wet lowland coastal forests. Nectar taken from approximately 16 species of eucalypt	1 record in the locality, in 2000 (NPWS Atlas). The study area does not support typical habitat for this species, but does contain some Yellow Box which is a frequent nectar source for the species (NPWS 1999). The Regent Honeyeater may occasionally occur in the study area, during seasons when the Yellow Box present is flowering profusely, but is not likely to utilise the degraded strips of woodland present in the median of the existing highway, given that extensive areas of similar but less disturbed resources are available on lands adjacent to the study area. This species is not likely to be affected by the proposed works.
Grey-headed Flying-fox <i>Pteropus poliocephalus</i> V (TSC) V (EPBC)	Roosts in large congregations during the day, dispersing at night to forage on flowering and fruiting plants across a large range (Strahan 1995).	Not listed within 10km on NPWS Atlas. No evidence for a 'camp' was recorded in the study area. This species could possibly utilise the study area for foraging on rare occasions, but is not likely to utilise vegetation present in the median of the existing highway given that extensive areas of similar less disturbed potential foraging habitat occur on land to the north and south of the study area. Not likely to be affected by proposed works.
Large-eared Pied Bat <i>Chalinolobus dwyeri</i> V (TSC) V (EPBC)	Inhabits dry sclerophyll forests and woodlands to the east and west of the Great Dividing Range (Strahan 1995). Roosts by day in caves and dis-used mine-tunnels (Strahan 1995).	Not listed within 10km on NPWS Atlas. The study area does not provide potential shelter for this species. May forage in the study area on occasions. Not likely to utilise vegetation present in the median of the existing highway given that extensive areas of similar less disturbed potential foraging habitat occur on land to the north and south of the study area. Not likely to be affected by proposed works.

Table 3 cont Relevance of threatened species known to occur within 10km of the study area, or considered likely to occur within 10km of the study area (NPWS Atlas, EPBC database).

Species	Habits/Requirements	Relevance to Study Area
Spotted-tailed Quoll <i>Dasyurus maculatus</i> V (TSC) V (EPBC)	Variety of habitats including sclerophyll forest and woodland, heathland and rainforest. Requires suitable den sites (eg hollow logs or caves), an abundance of food (small terrestrial birds and mammals), and relatively large areas of intact vegetation for foraging (NPWS 1999).	1 record in the locality, in 1992 (NPWS Atlas). The study area does not support large areas of intact vegetation. No den sites, potential den sites, or indirect evidence of this species were recorded during the surveys. This species may utilise vegetation in the locality, such as that to the north of the study area, on occasions, but is not considered likely to occur within the study area, due to the levels of habitat disturbance, and the noise and light generated by the Hume Highway. This species is not likely to be affected by the proposed works.
Brush-tailed Rock Wallaby <i>Petrogale penicillata</i> V (TSC) V (EPBC)	Inhabits rocky areas in a variety of habitats including rainforest gullies, wet and dry sclerophyll forest, open woodland and semi-arid country. Sites with numerous ledges, caves and crevices are favoured (Strahan 1995)	Not listed within 10km on NPWS Atlas. The study area does not contain rocky outcrops or similar features. This species is not considered likely to occur in the study area, and is not likely to be affected by the proposed works.
Green & Golden Bell Frog <i>Litoria aurea</i> E (TSC) E (EPBC)	Large permanent swamps and ponds with plenty of emergent vegetation (Robinson 1998; Cogger 1996)	1 record in the locality in 1975 (NPWS Atlas). Not listed as likely to occur in the locality on the EPBC database. Not recorded. The study area does not contain any areas of permanent water. This species is not likely to occur and is not likely to be affected by the proposed works.
Broad-headed Snake <i>Hoplocephalus bungaroides</i> E (TSC) V (EPBC)	Occurs within a 250km radius of Sydney. Largely confined to the Hawkesbury Sandstone formation where it is usually found under large slabs or rocky ridges, or in rocky crevices (Cogger 1996).	Not listed within 10km on NPWS Atlas. The study area does not provide potential habitat for this species. It is unlikely to occur in the study area and unlikely to be affected by the proposed works.
Striped Legless Lizard <i>Delma impar</i> V (TSC) V (EPBC)	Usually nocturnal, found under logs, rocks and ground debris in a variety of forest and woodland habitats, and grassy areas (Cogger 1996; Swan 1990).	1 record in the locality, in 1997 (NPWS Atlas). This species was not recorded in the study area, despite targeted searches beneath rocks and amongst ground litter. This species is likely to be relatively sedentary, occupying a limited home range. It does not appear to occur in areas of potential habitat within the study area and is therefore unlikely to be affected by the proposed works. If a substantial time period elapses prior to commencement of works (ie 6 months), it is recommended that additional targeted searches be conducted for this species, to ensure that it has not moved into potential habitats present in the study area.

In summary of Table 3, none of the species listed are considered likely to be affected by the proposed works due to:

- the degraded and fragmented nature of habitats and resources present within the study area, particularly within the median strip which is the area to be directly affected by the proposed works;
- the noise, light and other disturbances associated with the existing Hume Highway;
- the extensive areas of habitat and resources apparently similar to that present within the study area, located across adjacent lands to the north and south of the study area. These areas appear to be relatively intact (from interpretation of aerial photography and observance from the study area), and would not be as affected by highway disturbances. Most native fauna would utilise areas such as these rather than the study area, when the choice is available;
- lack of evidence for any of the species occurring within the study area;
- lack of critical features or resources for any of the species; and
- the highway appears to currently provide a significant barrier to fauna movements (other than flying fauna). The proposed works are not likely to interrupt any existing movement route for threatened species which may occur on lands to the north or south of the study area.

Five terrestrial bird species listed as migratory under the EPBC Act are known to occur in the locality (EPBC database), and could occur within the study area on occasions. These species are discussed further in Chapter 6 below. Migratory marine species are not considered relevant to the study area due to a lack of wetland habitats.

No fauna species being part of any relevant “*endangered population*” listed under the TSC Act were recorded during the field surveys, and no such species are considered likely to occur.

4 DISCUSSION OF IMPACTS

The proposed works would involve clearing of all vegetation and habitats present within the footprint of the proposed new road alignment. This is likely to affect virtually all of the native vegetation present within the median strip of the existing highway (approx 3ha of land).

The median currently supports a disturbed open woodland community, which appears to be regrowth following construction of the highway. Many of the trees and shrubs present, particularly the wattles, are likely to have been planted during revegetation works.

The study area does not support unique features or species that would be lost as a result of the proposed clearing. All species recorded within the study area are also likely to be present in surrounding areas.

The proposal would involve revegetation (using locally indigenous plant species) of temporarily disturbed land following completion of construction works.

The woodland within the median is a narrow strip fragmented by the existing carriageways of the highway, and by various other access tracks and previous clearing. This area does not appear to be of value for any threatened flora or fauna species, population or ecological community, or for any ROTAP species.

Only the most mobile and disturbance-tolerant of native fauna were recorded or would be expected to occur in the areas proposed to be disturbed (eg birds and microchiropteran bats). These species would move away from the noise of construction machinery and are unlikely to be directly affected by the proposed works. These species would be expected to return to the study area following completion of works.

Terrestrial species such as wombats, macropods and reptiles are not likely to occur within the parts of the study area that would be directly disturbed by the proposed works. These species would also be expected to move away from the noise and vibration of construction machinery. These species would not be likely to be directly affected by the proposed works and would be expected to return to the study area following completion of works.

The existing highway appears to currently provide a significant barrier to fauna movements in the study area. The proposal is not likely to further interrupt any existing fauna movement path.

The proposed works are part of ongoing maintenance and upgrading of the Hume Highway. Similar works are proposed for sections of the Hume Highway further southbound than the Tiyces Lane study area - at the Towrang and Carrick Road intersections. The proposed works at Tiyces Lane are not part of any on-going clearing and development of the area. The proposed works would not contribute to any significant cumulative impact upon the area.

Potential indirect impacts on native flora and fauna downstream of the site include increased nutrient loading of watercourses, the possible discharge of oils and other pollutants in watercourses, and increased erosion, soil loss and sedimentation. These impacts are to be minimised through the implementation of appropriate standard pollution and sediment control measures, and careful management of construction and on-going wastes. These impacts are not likely to be new or significant for any native fauna species.

5 NSW THREATENED SPECIES CONSERVATION ACT 1995

The *NSW Threatened Species Conservation Act 1995* (TSC Act) has modified the *NSW Environmental Planning & Assessment Act 1979* (EP&A Act) by including in Section 5A eight factors which are to be considered when determining "*whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats*". These eight factors "*must be taken into account*" by a consent or determining authority when considering a development proposal or Development Application, particularly in administering Sections 78, 79 and 112 of the EP&A Act.

5.1 Relevant Threatened Biota

5.1.1 Species

No flora or fauna species listed as threatened on the TSC Act were recorded during surveys conducted within the study area. No indirect evidence for threatened fauna species was recorded.

Threatened fauna species which are known or likely to occur in the locality (NPWS Atlas; EPBC Act search tool) are discussed in Table 3 above.

None of these species are considered likely to utilise parts of the study area to be cleared for the proposed works, and none are considered likely to be affected by the proposed works. A formal

assessment of significance of the potential impacts of the proposed works upon these species (pursuant to Section 5A of the EP&A Act) is therefore not required.

Recovery plans have been prepared under the Commonwealth EPBC Act for the following threatened fauna species considered in Table 3:

- Regent Honeyeater – objectives of this plan which are of relevance to the proposed works are: to enhance and create habitat for the Regent Honeyeater;
- Striped Legless Lizard – objectives of this plan which are of relevance to the proposed works are: to record and protect all viable populations of this species;
- Swift Parrot – objectives of this plan which are of relevance to the proposed works are: identification of priority habitats and sites, and improvement in quality of foraging habitat.

Recovery Plans are in preparation for the Brush-tailed Rock Wallaby, Grey-headed Flying-fox, Green & Golden Bell Frog and Tiger Quoll. These plans are not yet on public exhibition, and details are not available.

5.1.2 Populations

No flora or fauna species being part of any relevant “*endangered population*” listed under the TSC Act were recorded in the study area.

5.1.3 Ecological Communities

The woodland community present within the study area does not meet the description of any threatened ecological community listed under either the TSC Act or the EPBC Act.

5.2 Other Matters

5.2.1 Critical Habitat

The proposed works would not affect any declared critical habitat. No habitat protection plans are of relevance to the study area.

5.2.2 Key Threatening Processes

Road maintenance and upgrading is not listed as a Key Threatening Process under the TSC Act. However, the proposed works would involve some clearing of native vegetation, which is listed as a Key Threatening Process.

The removal of dead wood and dead trees is also listed as a Key Threatening Process. However, whilst the proposed works may involve some clearing of dead wood and/or dead trees, these features would not be removed from the study area, but placed on the ground within bushland to be retained (refer to Chapter 8 below).

Invasion of native plant communities by exotic perennial grasses is listed as a Key Threatening Process. Some of the listed exotic perennial grass species do occur within the study area. The proposed works do not involve introduction of these grasses to the study area.

No native flora or fauna species are likely to be significantly affected by the proposed works or clearing.

There are not currently any Threat Abatement Plans for these processes.

5.2.3 Regional Vegetation Management Plans

Greater Argyle Council did not provide any indication that there are regional vegetation or ecological management plans relevant to the study area.

5.3 Summary

The proposed re-alignment of the northbound carriageway of the Hume Highway at Tiyces Lane, east of Goulburn, is not likely to impose "a significant effect" upon any "threatened species, population or ecological community" listed on the TSC Act.

The proposed works would not affect any declared critical habitat.

The proposed works do involve some clearing of native vegetation, which is listed as a Key Threatening Process under the TSC Act.

Recovery Plans have been prepared for several of the threatened fauna species listed in Table 3. Objectives of these plans which are of relevance to the proposed works include creation/protection/enhancement of habitat, identification of viable populations and identification of priority habitats and sites. Refer to Chapter 8 below for recommendations regarding environmental management of the study area during the construction period.

There are no habitat protection plans, threat abatement plans, regional vegetation management plans or other plans of relevance to the study area or proposed works.

A Species Impact Statement is not required for this proposal.

6 COMMONWEALTH EPBC ACT 1999

The *Commonwealth Environment Protection & Biodiversity Conservation Act 1999* requires that an action which has, will have or is likely to have a significant impact upon one or more matters of National Environmental Significance (NES) must be referred to the Commonwealth Minister for Environment & Heritage for approval. These actions are referred to as 'controlled actions'.

Matters of NES include World Heritage properties, National Heritage Places, listed Ramsar Wetlands of international importance, listed threatened species and communities, listed migratory species, nuclear actions and Commonwealth marine areas.

6.1 Matters of National Environmental Significance

Table 3 lists threatened fauna species known or likely to occur within the locality of the study area. None of these species are considered likely to be affected by the proposed works (refer to Chapter 3.3).

Recovery plans have been prepared under the Commonwealth EPBC Act for the following threatened fauna species listed in Table 3:

- Regent Honeyeater – objectives of this plan which are of relevance to the proposed works are: to enhance and create habitat for the Regent Honeyeater;
- Striped Legless Lizard – objectives of this plan which are of relevance to the proposed works are: to record and protect all viable populations of this species;
- Swift Parrot – objectives of this plan which are of relevance to the proposed works are: identification of priority habitats and sites, and improvement in quality of foraging habitat.

Recovery Plans are also in preparation for the Brush-tailed Rock Wallaby, Grey-headed Flying-fox, Green & Golden Bell Frog and Tiger Quoll. These plans are not yet on public exhibition, and details are not available.

It is possible that some of the terrestrial migratory bird species listed as occurring in the locality (EPBC database) could occur in the study area on occasions. Migratory species listed include the White-bellied Sea Eagle, White-throated Needletail, Black-faced Monarch, Satin Flycatcher and Regent Honeyeater.

The proposed works would not affect any declared critical habitat. No habitat protection plans are of relevance to the study area.

Key threatening processes of relevance to the proposed works include 'Land Clearance'. No native flora or fauna species are likely to be significantly affected by the proposed works or clearing. There is not currently a Threat Abatement Plan for this process.

No other matters of NES are considered likely to be affected by the proposed works.

6.2 Requirement for Referral to the Commonwealth

6.2.1 *Threatened Species*

Table 3 lists threatened fauna species known or likely to occur within the locality of the study area. In summary of Table 3, the proposed works are not likely to impose a significant impact upon these species due to:

- the degraded and fragmented nature of habitats and resources present within the study area, particularly within the median strip which is the area to be directly affected by the proposed works;
- the noise, light and other disturbances associated with the existing Hume Highway;
- the extensive areas of habitat and resources apparently similar to that present within the study area, located across adjacent lands to the north and south of the study area. These areas appear to be relatively intact (from interpretation of aerial photography and observance from the study area), and would not be as affected by highway disturbances. Most native fauna would utilise areas such as these rather than the study area, when the choice is available;
- lack of evidence for any of the species occurring within the study area;
- lack of critical features or resources for any of the species; and
- the highway appears to currently provide a significant barrier to fauna movements (other than flying fauna). The proposed works are not likely to interrupt any existing movement route for threatened species which may occur on lands to the north or south of the study area.

6.2.2 *Migratory Species*

The proposed works are not considered likely to impose a significant impact upon migratory species for the same reasons listed above under Chapter 6.2.1.

6.3 Summary

The proposed works are not considered likely to impose 'a significant impact' upon any matter of NES. On this basis, referral to the Commonwealth Minister for Environment and Heritage under the EPBC Act is not required.

Recovery Plans have been prepared for several of the threatened fauna species listed in Table 3. Objectives of these plans which are of relevance to the proposed works include creation/protection/enhancement of habitat, identification of viable populations and identification of priority habitats and sites. Refer to Chapter 8 below for recommendations regarding environmental management of the study area during the construction period.

7 SEPP 44 – KOALA HABITAT PROTECTION

7.1 Relevance of SEPP 44

State Environmental Planning Policy No 44 (SEPP 44) *"aims to encourage the proper conservation and management of areas of natural vegetation that provide habitat for koalas to ensure a permanent free-living population over their present range and reverse the current trend of koala population decline"*.

The policy applies to land within Local Government Areas listed on Schedule 1 of the policy. Greater Argyle LGA (previously Mulwaree) is listed on Schedule 1.

Part 2 of the policy (Development Control of Koala Habitats) applies to land with an area (or adjoining lands under the same ownership with a combined area) of greater than 1 hectare. The study area is greater than 1 hectare in size (approximately 25ha).

Therefore, SEPP 44 is of relevance to the proposed works.

7.2 Determination of 'potential koala habitat'

'Potential koala habitat' is native vegetation where tree species listed under Schedule 2 of the Policy constitute 15% or greater of the number of trees present.

No tree species listed under Schedule 2 of the Policy were recorded within the study area. Therefore the study area does not support 'potential koala habitat', and the SEPP 44 no longer applies to the proposed works.

8 CONCLUSIONS AND RECOMMENDATIONS

8.1 Conclusions

The proposed re-alignment of the northbound carriageway of the Hume Highway at Tiyces Lane, east of Goulburn, is not likely to impose “a significant effect” upon any “threatened species, population or ecological community” listed on the TSC Act. A Species Impact Statement is not required for this proposal.

The proposed works are not considered likely to impose ‘a significant impact’ upon any matter of NES. On this basis, referral to the Commonwealth Minister for Environment and Heritage under the EPBC Act is not required.

The study area does not support ‘potential koala habitat’ as defined under SEPP 44, therefore SEPP 44 does not apply to the proposed works.

8.2 Recommendations

The following measures should be implemented to minimise the potential impacts of the proposed works upon native flora and fauna, and to assist with implementation of relevant threatened species Recovery Plans:

- if a substantial time period elapses prior to commencement of proposed works (*ie* 6 months), additional targeted surveys should be conducted for the Striped Legless Lizard *Delma impar*, to ensure that it has not moved into potential habitat present within the study area;
- larger trees, particularly those containing small hollows, should be removed relatively intact and placed on the ground in bushland areas within the road corridor which are to be retained, to provide additional habitat features for native fauna;
- tree-hollows present in trees to be cleared should be inspected immediately prior to clearing. Where native fauna are found, the trees should be removed at dusk (if practical), and the native fauna should then be gently encouraged to leave. If native fauna are injured, these should be transferred to the care of WIRES or other local animal rescue network;
- Wombats found in holes during clearing works should be gently encouraged to leave at dusk, then the hole filled in and compacted, and the surrounding area cleared of vegetation - to discourage the Wombat from returning before construction works commence. Empty Wombat holes should also be filled in when found;
- appropriate sediment control measures should be implemented during the clearing and construction phases of the project (eg silt fences, sediment traps), to protect terrestrial and aquatic habitats in the immediate vicinity and downstream. These should conform to relevant standard guidelines, should be maintained throughout the construction period and should be carefully removed following the completion of works;

This measure would compensate to a small extent for habitat loss resulting from the proposed works;

- the use of locally indigenous plant species in any replanting schemes, to provide habitat features for native flora and fauna, and to maintain the local and regional genetic resource.

These measures would assist to reduce the impacts of the proposed works, but do not fully compensate for the loss of vegetation and habitats. Compensatory measures are not regarded as necessary for the proposed works, given the limited extent of clearing proposed, the currently degraded condition of the majority of vegetation to be cleared, and that the proposed works are not likely to significantly affect any threatened fauna species.

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PROPOSED RE-ALIGNMENT OF THE HUME HIGHWAY
AT TIYCES LANE, EAST OF GOULBURN

ECOLOGICAL ASSESSMENT – FLORA AND FAUNA

APPENDIX 1

Inventory of flora species recorded

November 2004

APPENDIX 1 Flora species recorded in the study area along the Hume Highway during recent field investigations.

KEY

Status

* Exotic weed species (including native horticultural and non-endemic species)

N Noxious Weed (category ¹ see below) listed on the *NSW Noxious Weeds Act 1993* for the Mulwaree LGA

Status	SCIENTIFIC NAME	COMMON NAME
	FILICOPSIDA	
	Dennstaedtiaceae	
	<i>Pteridium esculentum</i>	Common Bracken Fern
	Sinopteridaceae	
	<i>Cheilanthes sieberi</i> ssp <i>sieberi</i>	Rock Fern
	CONIFEROPSIDA	
	Pinaceae	
*	<i>Pinus radiata</i>	Radiata Pine
	MAGNOLIOPSIDA: DICOTYLEDONS	
	Apiaceae	
*	<i>Foeniculum vulgare</i>	Fennel
	Asteraceae	
*	<i>Arctotheca calendula</i>	Capeweed
N (w3)	<i>Cassinia arcuata</i>	Sifton Bush/Chinese Shrub
	<i>Cassinia uncata</i>	Sticky Cassinia
*	<i>Cirsium vulgare</i>	Thistle
	<i>Chrysocephalum apiculatum</i>	Common Everlasting/Yellow Buttons
*	<i>Conzys bonariensis</i>	Flaxleaf/Fleabane
*	<i>Hypochoeris radicata</i>	Cat's Ears
	<i>Olearia microphylla</i>	Small-leaved Daisy Bush
N (w2)	<i>Senecio madagascariensis</i>	Fireweed
	<i>Senecio quadridentatus</i>	Cotton Fireweed
	Brassicaceae	
*	<i>Hirschfeldia incana</i>	Hairy Brassica/Buchan Weed
	Casuarinaceae	
	<i>Allocasuarina littoralis</i>	Black She-Oak
	Chenopodiaceae	
	<i>Einadia trigonos</i> ssp <i>trigonos</i>	Fishweed
	Dilleniaceae	
	<i>Hibbertia obtusifolia</i>	Grey Guinea Flower
	Epacridaceae	
	<i>Brachyloma daphnoides</i>	-
	<i>Lissanthe strigosa</i>	Peach Heath
	<i>Melichrus urceolatus</i>	Urn Heath
	Fabaceae: Faboideae	
	<i>Hardenbergia violacea</i>	Native Sarsparilla
	<i>Indigofera australis</i>	Native Indigo
*	<i>Lathyrus latifolius</i>	Perennial/Everlasting Pea
*	<i>Medicago polymorpha</i>	Medic
	<i>Melilotus indicus</i>	Hexham Scent

APPENDIX 1 cont Flora species recorded in the study area along the Hume Highway during recent field investigations.

Status	SCIENTIFIC NAME	COMMON NAME
*	Fabaceae: Faboideae cont	
	<i>Platylobium formosum</i> ssp <i>formosum</i>	Handsome Flat Pea
	<i>Podolobium ilicifolium</i>	Prickly Shaggy Pea
	<i>Trifolium repens</i>	White Clover
	Fabaceae: Mimosoideae	
	<i>Acacia baileyana</i>	Cootamundra Wattle
	<i>Acacia brownii</i>	Heath Wattle
	<i>Acacia buxifolia</i> ssp <i>buxifolia</i>	Box-leaved Wattle
	<i>Acacia decurrens</i>	Black/Green Wattle
	<i>Acacia genistifolia</i>	Early Wattle
	<i>Acacia gunnii</i>	Ploughshare Wattle
	<i>Acacia mearnsii</i>	Black Wattle
	<i>Acacia melanoxylon</i>	Blackwood
	<i>Acacia obtusifolia</i>	-
	<i>Acacia siculiformis</i>	Dagger Wattle
	<i>Acacia stricta</i>	Straight Wattle
	<i>Acacia terminalis</i> ssp <i>aurea</i>	Sunshine Wattle
	<i>Acacia ulicifolia</i>	Prickly Moses
	Geraniaceae	
	<i>Geranium neglectum</i>	Red Stem Cranesbill
*	Malaceae	
	<i>Cotoneaster glaucophyllus</i>	Cotoneaster
*	<i>Malus</i> sp.	Domestic Apple
*	Malvaceae	
	<i>Modiola caroliniana</i>	Carolina Mallow
	Myrtaceae	
	<i>Eucalyptus cinerea</i>	Argyle Apple
	<i>Eucalyptus dives</i>	Eurabbie
	<i>Eucalyptus mannifera</i> ssp <i>mannifera</i>	Brittle Gum
	<i>Eucalyptus macrorhyncha</i>	Red Stringybark
	<i>Eucalyptus melliodora</i>	Yellow Box
	<i>Eucalyptus rossii</i>	Scribbly Gum
	<i>Eucalyptus sieberi</i>	Silvertop Ash
	Oxalidaceae	
	<i>Oxalis</i> sp.	Oxalis
	Pittosporaceae	
	<i>Rhytidosporum prostratum</i>	-
*	Plantaginaceae	
	<i>Plantago lanceolata</i>	Lambs Tongues
*	Polygonaceae	
	<i>Rumex crispus</i>	Curled Dock
	Proteaceae	
	<i>Banksia spinulosa</i> var. <i>spinulosa</i>	Hairpin Banksia
	<i>Grevillea rosmarinifolia</i> ssp <i>rosmarinifolia</i>	Grevillea
	<i>Persoonia linearis</i>	Narrow-leaf Geebung
	<i>Persoonia mollis</i> ssp <i>lioens</i>	Geebung
N (W3) N (W3) *	Rosaceae	
	<i>Prunus</i> sp.	Flowering Fruit Tree
	<i>Rosa rubiginosa</i>	Sweet Briar
	<i>Rubus fruticosus</i>	Blackberry
	<i>Sanguisorba minor</i> ssp <i>muricata</i>	Sheep's Burnet
	Santalaceae	
	<i>Exocarpus cupressiformis</i>	Cherry Ballarat/Native Cherry
	<i>Omphacomeria acerba</i>	Leafless Sour Bush

APPENDIX 1 cont Flora species recorded in the study area along the Hume Highway during recent field investigations.

Status	SCIENTIFIC NAME	COMMON NAME
*	Verbenaceae	
*	<i>Verbena bonariensis</i>	Purple Top
*	<i>Verbena officinalis</i>	Common Verbena
	MAGNOLIOPSIDA: MONOCOTYLEDONS	
*	Cyperaceae	
	<i>Cyperus rotundus</i>	Nut Grass
	Iridaceae	
	<i>Patersonia sericea</i>	Native Iris/Purple Flag
	Juncaceae	
	<i>Juncus acutus</i>	Sharp Rush
	<i>Juncus</i> sp	-
	Phormiaceae	
	<i>Dianella revoluta</i>	Flax Lily
	<i>Dianella longifolia</i>	Blue Flax Lily
	<i>Stypandra glauca</i>	Nodding Blue Lily
	Lomandraceae	
	<i>Lomandra longifolia</i>	Spiny-headed Mat-rush
	<i>Lomandra filiformis</i> ssp <i>coriacea</i>	Mat-rush
	<i>Lomandra filiformis</i>	-
	Poaceae	
	<i>Aristida</i> sp	Wiregrass
	<i>Austrodanthonia caespitosa</i>	Ringed Wallaby Grass
*	<i>Avena fatua</i>	Wild Oat
*	<i>Briza minor</i>	Shivery Grass
	<i>Chionochloa pallida</i>	Silvertop Wallaby Grass
*	<i>Dactylis glomerata</i>	Cocksfoot
	<i>Elymus scaber</i> var <i>scaber</i>	Common Wheatgrass
N (W3)	<i>Eragrostis curvula</i>	African Lovegrass
	<i>Eragrostis</i> sp.	Lovegrass
*	<i>Holcus lanatus</i>	Yorkshire Fog
*	<i>Lolium perenne</i>	Perennial Ryegrass
*	<i>Paspalum dilatatum</i>	Paspalum
*	<i>Phalaris aquatica</i>	Phalaris
*	<i>Poa annua</i>	Winter Grass
	<i>Poa sieberiana</i> var. <i>sieberiana</i>	Snowgrass
	<i>Stipa scabra</i>	Rough Spear Grass
	<i>Themeda australis</i>	Kangaroo Grass
	Xanthorrhoeaceae	
	<i>Xanthorrhoea</i> sp.	Grass Tree

¹ Noxious Weed Categories

W2 – The weed must be fully and continuously suppressed and destroyed.

W3 – The weed must be prevented from spreading and its numbers and distribution reduced.

PROPOSED RE-ALIGNMENT OF THE HUME HIGHWAY
AT TIYCES LANE, EAST OF GOULBURN

ECOLOGICAL ASSESSMENT – FLORA AND FAUNA

APPENDIX 2

Inventory of fauna species recorded

November 2004

APPENDIX 2 Fauna species recorded in the study area along the Hume Highway during specific field investigations, and previously in the vicinity (NPWS Wildlife Atlas).

KEY	
Status	
*	Introduced species
M	Migratory species listed under the Commonwealth EPBC Act
E (EPBC)	Endangered species listed on the Commonwealth EPBC Act
E (TSC)	Endangered species listed on the NSW TSC Act
V (EPBC)	Vulnerable species listed on the Commonwealth EPBC Act
V (TSC)	Vulnerable species listed on the NSW TSC Act
Location	
A	Species recorded in the study area during current surveys.
B	Species recorded previously nearby (Hayes 2004; Mulwaree Council), and within 10 kilometers of the study area (NPWS Atlas of NSW Wildlife)

Status	COMMON NAME	SCIENTIFIC NAME	A	B
	BIRDS			
	Phasianidae			
	Stubble Quail	<i>Coturnix pectoralis</i>		✓
	Anatidae			
M	Australian Wood Duck	<i>Chenonetta jubata</i>		✓
	Ardeidae			
	White-faced Heron	<i>Egretta novaehollandiae</i>		✓
	White-necked Heron	<i>Ardea pacifica</i>		✓
	Threskiornithidae			
	Australian White Ibis	<i>Threskiornis molucca</i>		✓
	Accipitridae			
M	Wedge-tailed Eagle	<i>Aquila audax</i>		✓
	Falconidae			
M	Brown Falcon	<i>Falco berigora</i>		✓
	Rallidae			
	Eurasian Coot	<i>Fulica atra</i>		✓
	Laridae			
	Silver Gull	<i>Larus novaehollandiae</i>		✓
	Columbidae			
	Crested Pigeon	<i>Ocyphaps lophotes</i>	✓	✓
	Cacatuidae			
	Long-billed Corella	<i>Cacatua tenuirostris</i>		✓
	Galah	<i>Cacatua roseicapilla</i>	✓	✓
	Sulphur-crested Cockatoo	<i>Cacatua galerita</i>		✓
	Psittacidae			
	Eastern Rosella	<i>Platycercus eximius</i>		✓
	Crimson Rosella	<i>Platycercus elegans</i>	✓	✓
	Red-rumped Parrot	<i>Psephotes haematonotus</i>		✓
	Strigidae			
	Southern Boobook	<i>Ninox boobook</i>		✓
	Podargidae			
	Tawny Frogmouth	<i>Podargus strigoides</i>	✓	

APPENDIX 2 cont Fauna species recorded in the study area along the Hume Highway during specific field investigations, and previously in the vicinity (NPWS Wildlife Atlas).

Status	COMMON NAME	SCIENTIFIC NAME	A	B
E (TSC & EPBC)	Halcyonidae Laughing Kookaburra	<i>Dacelo novaeguineae</i>	✓	✓
	Pachycephalidae Golden Whistler	<i>Pachycephala pectoralis</i>		✓
	Dicruridae Grey Fantail	<i>Rhipidura albiscapa</i>	✓	✓
	Willie Wagtail	<i>Rhipidura leucophrys</i>		✓
	Magpie-lark	<i>Grallina cyanoleuca</i>	✓	✓
	Campephagidae Cicadabird	<i>Coracina tenuirostris</i>		✓
	Maluridae Superb Fairy-wren	<i>Malurus cyaneus</i>	✓	✓
	Pardalotidae Spotted Pardalote	<i>Pardalotus punctatus</i>		✓
	Striated Pardalote	<i>Pardalotus striatus</i>		✓
	Meliphagidae Noisy Miner	<i>Manorina melanocephalus</i>		✓
	Noisy Friarbird	<i>Philemon corniculatus</i>		✓
	Red Wattlebird	<i>Anthochaera carunculata</i>	✓	✓
	Yellow-faced Honeyeater	<i>Lichenostomus chrysops</i>		✓
	Regent Honeyeater	<i>Xanthomyza phrygia</i>		✓
	Artamidae Pied Currawong	<i>Strepera graculina</i>		✓
	Australian Magpie	<i>Gymnorhina tibicen</i>	✓	✓
	Corvidae Australian Raven	<i>Corvus coronoides</i>	✓	✓
	Corcoracidae White-winged Chough	<i>Corcorax melanorhamphos</i>		✓
	Hirundinidae Welcome Swallow	<i>Hirundo neoxena</i>	✓	
	Sylviidae Golden-headed Cisticola	<i>Cisticola exilis</i>		✓
	Zosteropidae Silvereye	<i>Zosterops lateralis</i>		✓
	Sturnidae Common Starling	<i>Sturnus vulgaris</i>		✓
V (TSC & EPBC)	REPTILES			
	Gekkonidae Eastern Stone Gecko	<i>Diplodactylus vittatus</i>		✓
	Pygopodidae Striped Legless Lizard	<i>Delma impar</i>		✓
	Typhlopidae Proximus Blind Snake	<i>Ramphotyphlops proximus</i>		✓
	Elapidae Variable Black-naped Snake	<i>Suta spectabilis dwyeri</i>		✓
	Eastern Brown Snake	<i>Pseudonaja textilis</i>		✓
	Red-bellied Black Snake	<i>Pseudechis porphyriacus</i>		✓

APPENDIX 2 cont Fauna species recorded in the study area along the Hume Highway during specific field investigations, and previously in the vicinity (NPWS Wildlife Atlas).

Status	COMMON NAME	SCIENTIFIC NAME	A	B
E (TSC & EPBC)	AMPHIBIANS			
	Hylidae Green & Golden Bell Frog	<i>Litoria aurea</i>		✓
	Myobatrachidae Common Eastern Froglet	<i>Crinia signifera</i>		✓
V (TSC & EPBC)	MAMMALS			
	Ornithorhynchidae Platypus	<i>Ornithorhynchus anatinus</i>		✓
	Dasyuridae Spotted-tailed Quoll	<i>Dasyurus maculatus</i>		✓
	Vombatidae Common Wombat	<i>Vombatus ursinus</i>	✓	✓
	Macropodidae Common Wallaroo	<i>Macropus robustus</i>		✓
	Eastern Grey Kangaroo	<i>Macropus giganteus</i>	✓	✓
	Red-necked Wallaby	<i>Macropus rufogriseus</i>		✓
	Swamp Wallaby	<i>Wallabia bicolor</i>	✓	✓
	Introduced Mammals			
	* Rabbit	<i>Oryctolagus cuniculus</i>	✓	✓
*	Fox	<i>Vulpes vulpes</i>	✓	
*	Deer	?		✓
*	Dog	<i>Canis familiaris</i>		✓

Appendix B Photographs of the Proposal site

SITE PHOTOGRAPHS – Hume Highway Realignment, Northbound Carriageway at Tiyces Lane



View to west along proposed road alignment at west end of Proposal site.



View to east along proposed road alignment east of Tiyces Lane.

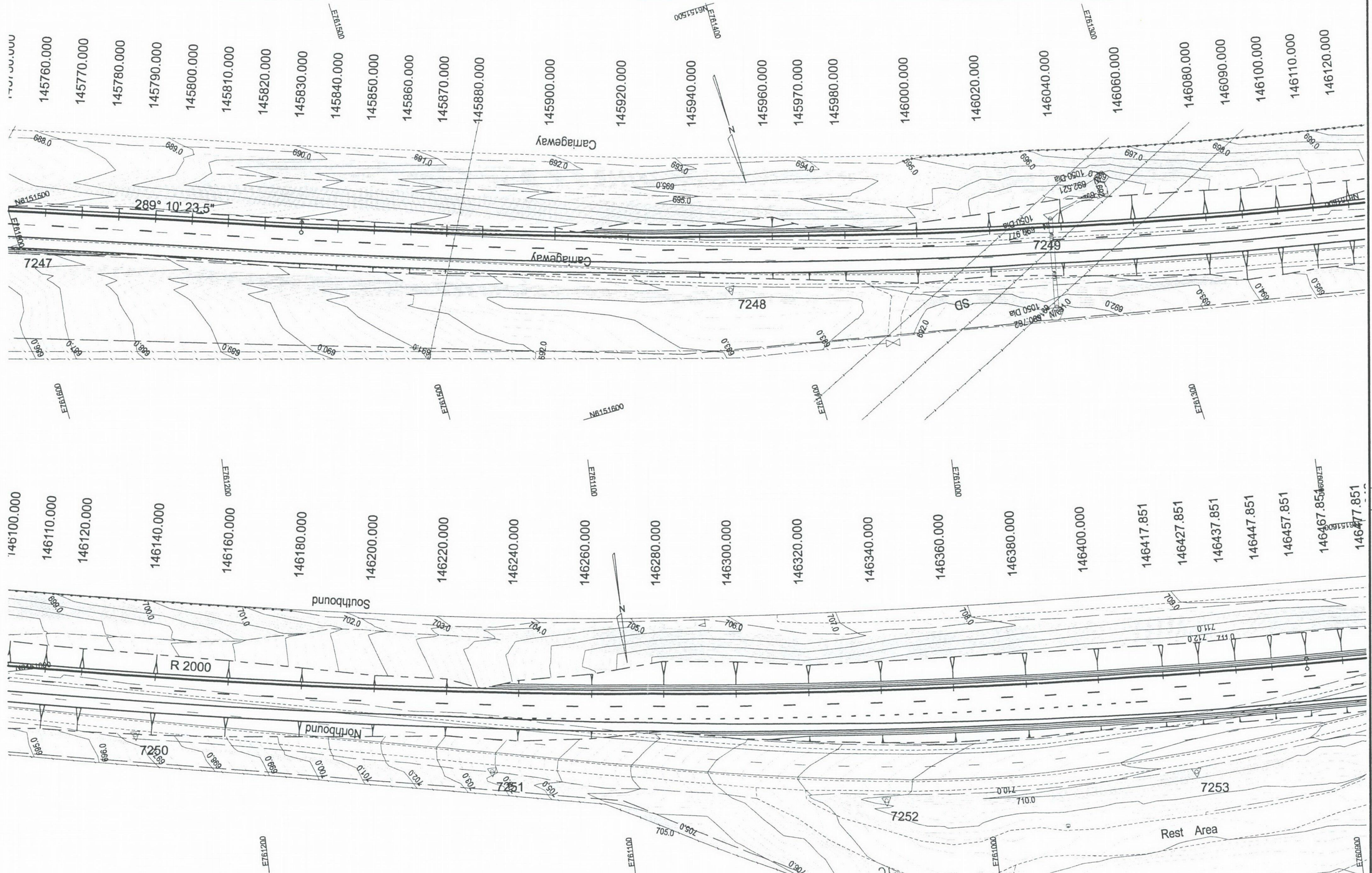


View to west along proposed road alignment west of Tiyces Lane.

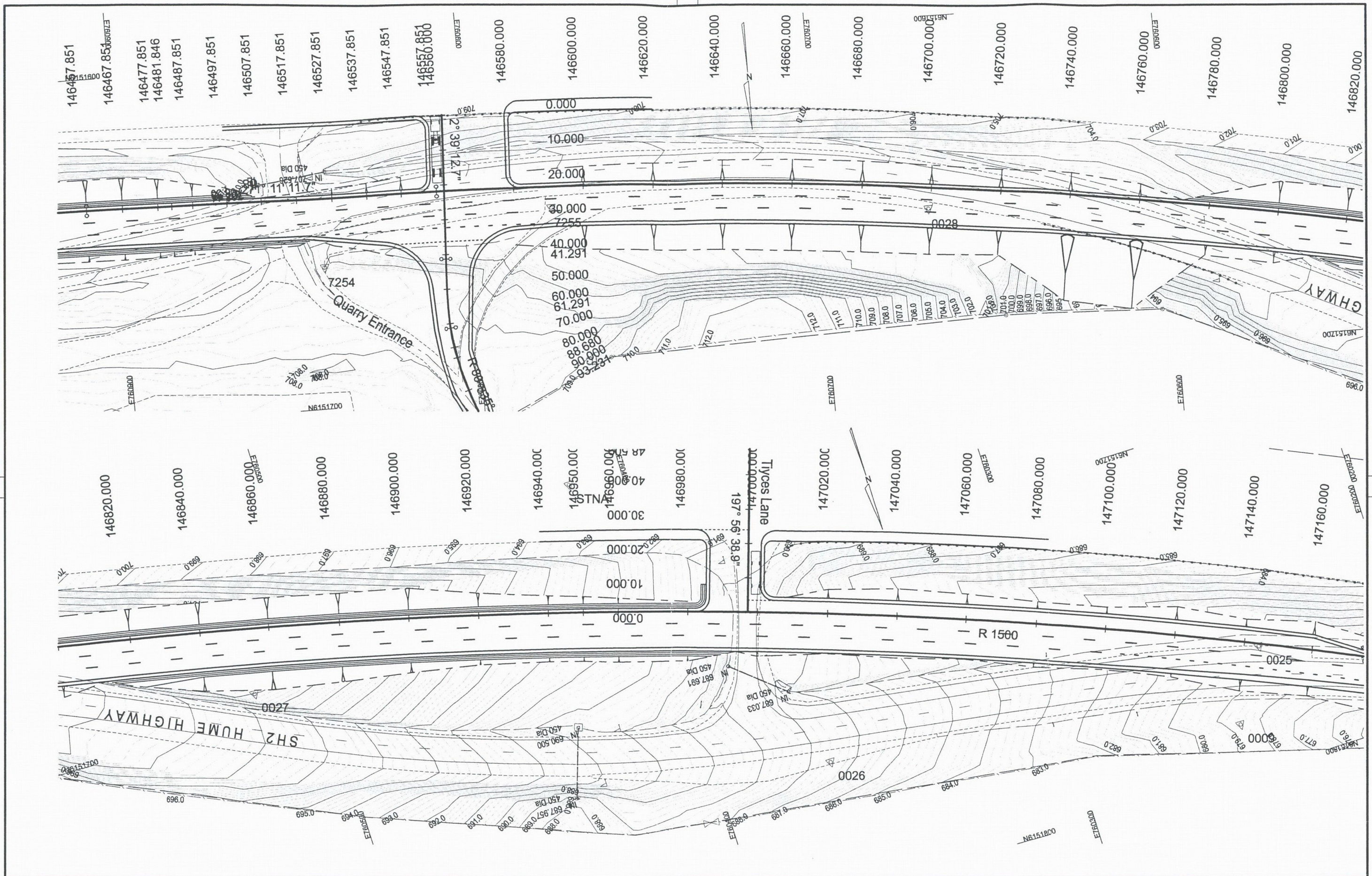


View to east along proposed road alignment at east end of Proposal site.

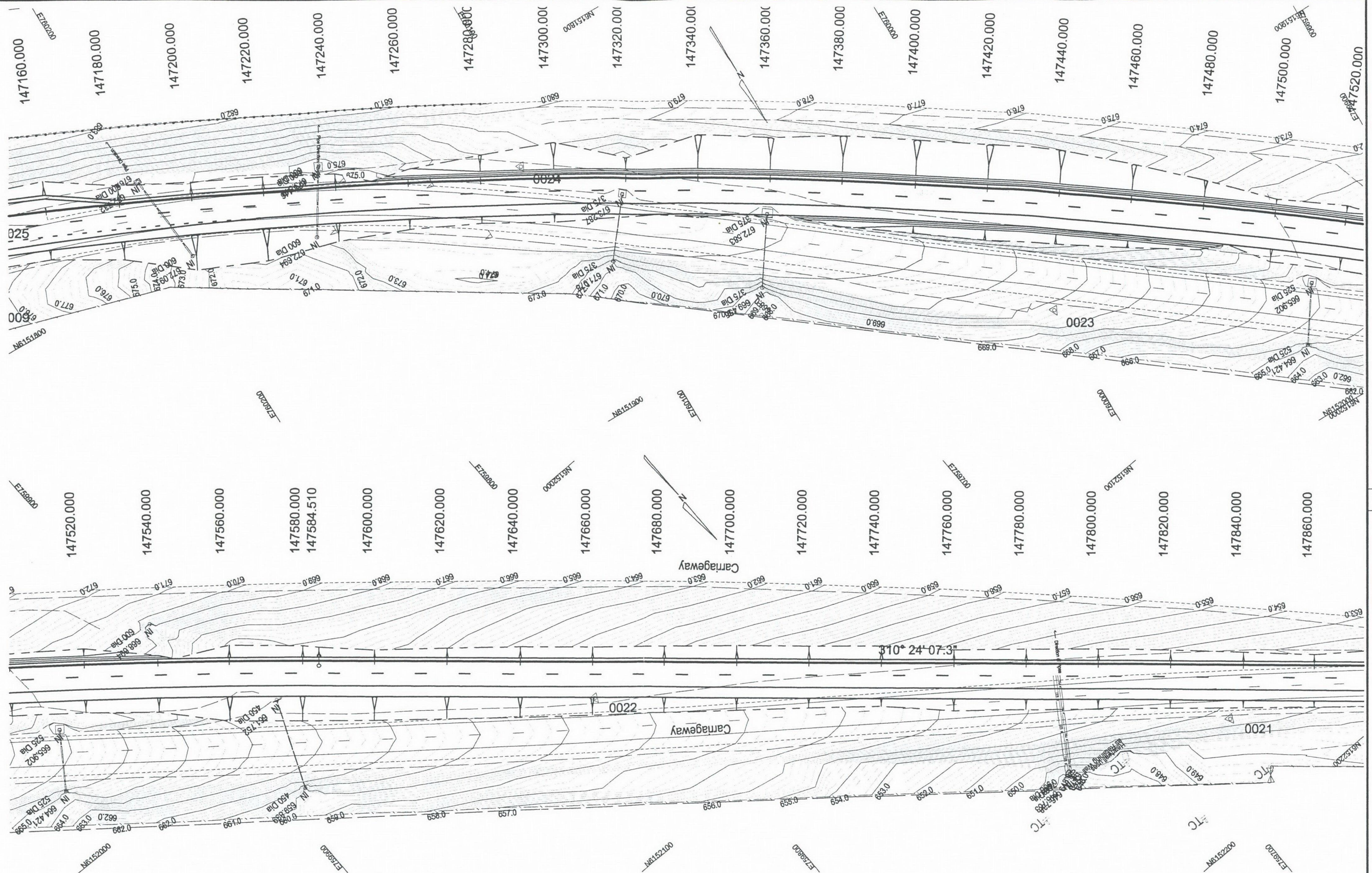
Appendix C Concept Design



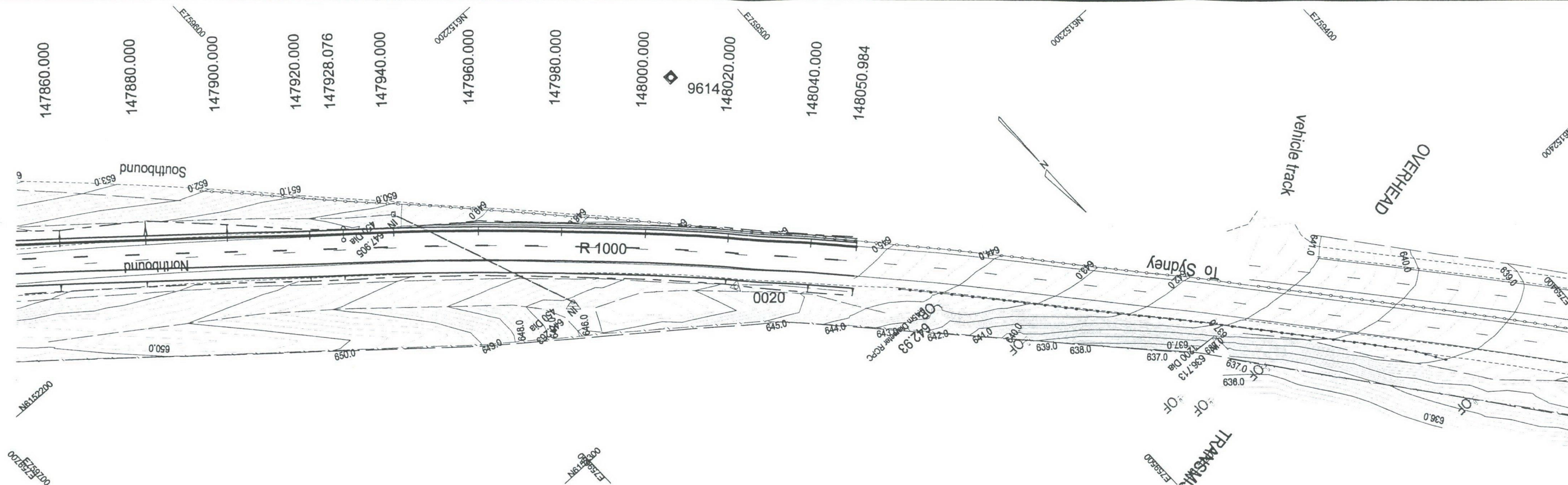
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No	AMENDMENT DETAIL	AUTH	DATE		PREPARED BY SOUTHERN TECHNICAL SERVICES PROJECT DESIGN, WOLLONGONG	Roads and Traffic Authority of NSW	DRAWING NAME 02 Concept.dgn	ORIGINAL ISSUE	SHEET NO.
				SCALE 1:1000 10 0 20 40	DESIGNED M. KEECH REVIEWED	SH2 - HUME HIGHWAY - GREATER ARGYLE REALIGNMENT OF NORTHBOUND CARRIAGEWAY AT TIYCES LANE 145.8 km TO 148.0 km SOUTH OF MITTAGONG PLAN DETAILS	REGISTRATION NUMBER 0002.185.RC.0002		02



No	AMENDMENT DETAIL	AUTH	DATE	SCALE 1:1000	
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No	AMENDMENT DETAIL	AUTH	DATE			PREPARED BY SOUTHERN TECHNICAL SERVICES PROJECT DESIGN, WOLLONGONG	Roads and Traffic Authority of NSW	DRAWING NAME 04 Concept.dgn	ORIGINAL ISSUE	SHEET NO.
				SCALE 1:1000 10 0 20 40		DESIGNED M. KEECH REVIEWED	SH2 - HUME HIGHWAY - GREATER ARGYLE REALIGNMENT OF NORTHBOUND CARRIAGEWAY AT TIYCES LANE 145.8 km TO 148.0 km SOUTH OF MITTAGONG PLAN DETAILS			
								REGISTRATION NUMBER 0002.185.RC.0002		04

Appendix D Consultation



Department of
Infrastructure, Planning and Natural Resources

Our Ref. ERM04/3243

Your Ref. WBS Ref: H/44127/A

Roads and Traffic Authority
Level 5 Pod D
99 Phillip Street
PARRAMATTA NSW 2124

Attention: Peter Ryan

**Re: Proposed Realignment of the Northbound Carriageway of the Hume Highway
(SH2) at Tiyces Lane**

The following comments are made in respect of the Department's role as the Consent Authority for clearing of native vegetation under the *Native Vegetation Conservation Act 1997*.

It is noted the proposed road works are to be contained within the road reserve of State Highway 2 Hume Highway.

It is considered that any clearing of native vegetation required for the road works is excluded from the need for development consent under the *Native Vegetation Conservation Act 1997* by virtue of section 12(m):

"This Act does not apply to the following types of clearing:

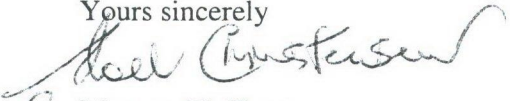
(m) any clearing that involves the removal or lopping of any tree or other vegetation in accordance with section 88 of the Roads Act 1993,"

This means that no approval is necessary from DIPNR for clearing of native vegetation associated with the proposed roadworks.

As a matter of good practice, it is recommended that any clearing of native vegetation be done to the minimum extent necessary for the work. Any compounds and stockpile sites should be located to avoid impacting on native vegetation.

Any queries relating to matters raised above should be directed to Robert Adam in Goulburn Office ph: 4828 6704.

Yours sincerely


for Marwan El Chamy
Manager Resource Access
South Coast Region
31 August 2004



PO Box 323 Penrith NSW 2751
Level 2, 311 High Street
Penrith NSW 2750
Tel 1300 722 468 Fax 02 4732 3666
Email info@sca.nsw.gov.au
Website www.sca.nsw.gov.au

Ref: 2004/01944

Your Ref: WBS Ref: H/44127/A

Mr Peter Ryan
Environment Officer
Roads and Traffic Authority
Level 5, Pod D
99 Phillip Street
PARRAMATTA NSW 2124

Dear Mr Ryan

**Proposed realignment of the northbound carriageway of the Hume Highway
(SH2) at Tiyces Lane**

I refer to your email dated 8 September 2004 regarding the above. The Sydney Catchment Authority (SCA) appreciates being consulted at this stage.

The SCA has the following comments for consideration in the development of the proposal and the environmental assessment process.

General comments

The proposed works are located in the hydrological catchment of the dams managed the SCA. In particular the works are located in the Wollondilly River subcatchment.

The proposed works have the potential to impact on the quality of waters in the catchment during both the construction and operation stages. The Roads and Traffic Authority should consider water quality issues in the design, construction and operational stages of the project. Application of the RTA's Water Policy and Code of Practice for Water Management should substantially address water quality issues of interest to the SCA.

Specific comments

1. Planning controls. State Environmental Planning Policy No.58-Protecting Sydney's Water Supply applies to the site. SEPP 58 states that road work on classified roads requires development consent from the local council other than road work comprising repair or maintenance. The SCA recommends that the RTA confirm with the local council as to whether they consider a development application is required.
2. Matters for consideration. Irrespective of whether the proposal is assessed under Part 4 or 5 of the Environmental Planning and Assessment Act, there is a need for decision making authorities to consider clause 10 of SEPP 58. Therefore the development application or the Review of Environmental Factors

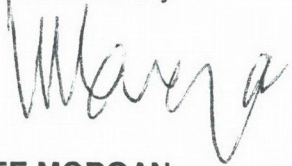
(REF) should specifically address each part of clause 10. Attached is a guideline prepared by DIPNR which may assist in this regard.

3. Stormwater management. The SCA considers there may be opportunities to improve the management of stormwater from adjacent sections of the highway in conjunction with the works required for the proposal. The SCA encourages the RTA to investigate these opportunities.
4. Soil and water management. The SCA would like the opportunity to comment on draft soil and water management plans.
5. Approvals. No approvals are required from the SCA for the proposal (note however that if a development application is required the council will need to notify the SCA of the application and provide the Authority with 21 days to provide comments.

The SCA requests the opportunity to provide comments on drafts of the development application or REF.

If you wish to discuss this matter please contact Malcolm Hughes on 47252139 or malcolm.hughes@sca.nsw.gov.au

Yours sincerely



LEE MORGAN
Manager Statutory Planning

Encl.

25.11.54

Guidelines for the use of State Environmental Planning Policy No. 58 – Protecting Sydney's Water Supply

Introduction

State Environmental Planning Policy No.58 - Protecting Sydney's Water Supply was prepared under the *Environmental Planning and Assessment Act 1979* ("the Act") and came into effect on 1 February 1999 to ensure that development in the hydrological catchment from which Sydney draws its drinking water supply does not have a detrimental impact on water quality.

SEPP 58 was prepared as an interim measure pending the preparation of a regional environmental plan (REP) for the catchment areas. It represents one of a package of water quality protection measures arising from the recommendations of the McClellan Inquiry into the mid-1998 contamination of Sydney's drinking water supply. The inquiry found that the catchment areas were seriously compromised with a large number of land uses causing ongoing water quality problems in catchment tributaries and streams.

The Inquiry report recommended the establishment of a catchment authority with a concurrence role in relation to development within the catchments and the provision of strong planning controls over the catchment areas. The Sydney Catchment Authority was established on 1 July 1999 to undertake this role and SEPP 58 is intended to provide the necessary planning controls in the short term until it is replaced by the REP.

Amendment No.1 to SEPP 58 was gazetted and took effect on 31 March 2000. The primary purpose of this amendment was to transfer responsibility for the notification and concurrence provisions in the policy from the Director General of Urban Affairs and Planning to the Chief Executive of the Sydney Catchment Authority. A small number of administrative, definitional and mapping amendments were also made to improve the efficiency and effectiveness of the policy.

Amendment No.2 to SEPP 58 was gazetted and took effect on 1 February 2002. This amendment was made in response to concerns raised by the Healthy Rivers Commission's Inquiry into the Shoalhaven River System. The inquiry identified unacceptable impacts resulting from the level of development in the Kangaroo Valley.

Consultation between the Minister for the Environment and the Minister for Urban Affairs and Planning identified that an amendment to SEPP 58 to give the Sydney Catchment Authority concurrence powers over high risk development within the Kangaroo Valley would be the best option to address threats to water quality within the Kangaroo Valley catchment.

Amendment No. 2 requires the concurrence of the Sydney Catchment Authority for developments listed under Schedules 1 and 2 of the SEPP in

Kangaroo Valley. As part of Amendment No. 2, other minor amendments have been made including requiring copies of all development consent determinations (consents and refusals) to which clauses 11 and 12 apply to be forwarded to the Chief Executive of the SCA and amending the definition of "*unsewered development*" in Schedule 2 to ensure that all new on-site effluent proposals are scrutinised by the Chief Executive of the SCA.

CONTENTS OF THE SEPP

The following advice is provided on the individual clauses of the SEPP to assist with its interpretation.

Clause 1: Name of Policy

Gives the name and number of the SEPP.

Clause 2: Commencement

Establishes that the provisions of the SEPP first took effect on 1 February 1999.

Clause 3: Aims of Policy

This clause sets out the aims of the SEPP which are:

- to ensure that development in the catchment areas from which Sydney's drinking water is drawn does not have an adverse impact on water quality;
- to provide concurrence or notification roles for the Chief Executive of the Sydney Catchment Authority in relation to certain listed developments that could have an adverse impact on water quality; and
- to ensure that there is a consistent approach when assessing the possible impact of development proposals on water quality within the catchments.

Clause 4: Definitions

This clause provides the definitions of terms used in the SEPP.

Clause 5: Land to which this Policy applies

The land to which the SEPP applies is identified by this clause.

The policy applies to all land within the catchments shown edged heavy black on the series of 1:100,000 maps marked "State Environmental Planning Policy No. 58 - Protecting Sydney's Water Supply", "State Environmental Planning Policy No. 58 - Protecting Sydney's Water Supply (Amendment No.1)" and the 1:50 000 map "State Environmental Planning Policy No.58 – Protecting Sydney's Water Supply (Amendment No.2)". The Amendment No.2 map is an addendum to maps 9 and 10 of the 13 map set.

The maps are held in the offices of PlanningNSW with copies in the Sydney Catchment Authority head office and Local Councils affected by the SEPP.

Parts or all of the following local government areas are affected by the provisions of the SEPP:

Blue Mountains	Mulwaree
Campbelltown	Oberon
Crookwell	Shoalhaven
Eurobodalla	Sutherland
Goulburn	Tallaganda
Gunning	Wingecaribee
Kiama	Wollondilly
Lithgow	Wollongong

The catchments of the Tallowa, Fitzroy Falls, Wingecaribee, Warragamba, Avon, Nepean, Cordeaux, Cataract and Woronora Dams, Broughton's Pass and Pheasants Nest Weirs and the Blue Mountains storages at Blackheath, Katoomba and Woodford all form essential components of an integrated water supply scheme and are therefore included in the SEPP.

Amendment No.1 added several small areas of land in the vicinity of Silverdale Road, The Oaks, Werombi, and Orangeville which fall within the hydrological catchment and which were previously omitted from the SEPP 58 area.

Clause 6: Relationship to other environmental planning instruments

This clause establishes the relationship between the SEPP and other environmental planning instruments.

If this SEPP is inconsistent with another environmental planning instrument made before or after this SEPP, this SEPP prevails to the extent of the inconsistency.

Clause 6(1A) establishes that SEPP 58 does not affect clause 11E of SEPP4 – Development Without Consent and enables Sydney Water and the Sydney Catchment Authority to undertake emergency and routine maintenance works without the need to obtain consent.

Clause 6(1B) of SEPP 58 establishes that development is not complying development within the meaning of SEPP 60 – Exempt and Complying Development if it is carried out on unsewered land within the SEPP 58 area.

The provisions of clause 6(2) establish that where consultation with or the concurrence of Sydney Water is required by another environmental planning instrument in relation to the matters covered by the SEPP, the concurrence of, or notification to, the Chief Executive of the Sydney Catchment Authority is required instead. Clause 6 (2A) requires that when a LEP has a concurrence requirement, these requirements apply together with the requirements of SEPP 58.

The relevant environmental planning instruments and clauses are:

Blue Mountains LEP No.4, clauses 44 and 58A(4)(c)
Blue Mountains LEP 1991, clause 11.6(a)
City of Campbelltown IDO No. 15, clause 12(1)
Mulwaree LEP 1995, clauses 12(7), 13(4), 36 and 39
City of Shoalhaven LEP 1985, clause 25(1)
Sutherland Shire LEP 1993, paragraph 2 of Zone 7(c) in Zoning Table
Tallaganda LEP 1991, clause 13(4), 14(4), 15(4) and 43(1)
Wingecarribee LEP 1989, clauses 38F(3) and 43(1)
Wollondilly LEP 1991, clause 17
City of Wollongong LEP 1990, clause 16

Amendment No 1 added clauses 12(7) and 13(4) of Mulwaree LEP 1995 and clauses 13(4), 14(4) and 15(4) of Tallaganda LEP 1991 to the list of LEP clauses which the policy amends.

Clause 7: Suspension of laws

This clause was repealed as part of Amendment No. 1

Clause 8: Consent to Schedule 1 or 2 development

This clause requires development consent to be obtained for all development listed in Schedules 1 and 2 of the SEPP.

Clause 9: Consent authority

The consent authority for any development listed in Schedules 1 and 2 is the relevant Council, with the exception of State Significant Development, where the Minister is the consent authority.

Clause 10: Matters for consideration

This clause identifies the matters in which the Chief Executive, consent authorities under Part 4 of the Act and proponents or determining authorities under Part 5 of the Act must take into account when considering proposals within the catchment.

The matters are:

- whether water quality will be maintained or improved as a result of the development;
- whether the water quality management practices proposed will be sustainable in the long term; and
- whether the development will be compatible with relevant water quality objectives and standards for the hydrological catchment when adopted by Government.

Water quality objectives for the hydrological catchment have been proposed by the community through the Healthy Rivers Commission Inquiries.

The general catchment-wide objective for water quality is for improvement in water quality in degraded and critical locations and maintenance (or improvement) of water quality where it is currently adequate.

The specific water quality objectives are:

- the achievement of those environmental values for water quality identified in the reports of the Healthy Rivers Commission (HRC) for the Hawkesbury Nepean, Shoalhaven and Woronora catchments, as endorsed by Cabinet (HRC, 1998, 1999a, 1999b, 1999c); Note that at the time of writing objective for Woronora have not been signed off by Government.
- Those criteria specified in the *prevailing* ANZECC guidelines that correspond to the identified environmental values, as modified by any subsequent detailed investigation and ongoing adaptive environmental management.
- Those criteria for nutrients recommended in the Healthy Rivers Commission reports which narrow the wide range of nutrients provided for in ANZECC (1992).
- those criteria developed by ANZECC/NHMRC/ARMCANZ/NSW Health for *cryptosporidium*, *Giardia*, faecal coliforms or other public health indicators for the storages and for the output of the water treatment plants.

The environmental values for the catchment are:

1. Protection of aquatic ecosystems
2. Protection of primary contact recreation
3. Protection of farmstead water
4. Protection of human consumers of cooked fish, shellfish and crustaceans

Environmental value applying only to those sections of the streams that are within the SCA special areas or from which water is extracted:

5. Protection of drinking water for use in urban water supply.

Approval authorities when considering the impact of a proposal on water quality should, where necessary, consider:

- whether the proposed development or activity is designed in accordance with the *Guidelines for On-site Sewage Management for Single Households* (published by the Department of Local Government, Environment Protection Authority, NSW Health, the Department of Land and Water Conservation and PlanningNSW) and AS/NZS 1547:2000 On-site domestic-wastewater management;

- the impact of the proposal on riparian vegetation and stream bank stability;
- whether the proposal provides opportunities for rehabilitation of degraded areas; and
- the likely cumulative impact of the proposal on water quality.

Clause 11: Concurrence of Chief Executive

This clause describes where the concurrence of the Chief Executive is required for the different categories of development identified in Schedules 1 and 2. It also lists the matters the Chief Executive will take into account in deciding whether or not to grant concurrence. Concurrence is not required for State Significant Development.

Development identified in Schedule 1 requires the concurrence of the Chief Executive for all catchments except the Shoalhaven (with the exception of the Kangaroo Valley Area). The Shoalhaven catchment (with the exception of the Special Area and Kangaroo Valley Area) is excluded from a concurrence requirement as it currently provides only a small percentage of Sydney's water supply.

Development identified in either Schedule 1 or 2 requires the concurrence of the Chief Executive if it is within a Special Area or the Kangaroo Valley Area.

In deciding whether to grant concurrence the Chief Executive will take into consideration the matters set out in clause 10 of the SEPP, as well as a water cycle management study prepared to accompany the development application and the results of consultations with relevant government agencies.

The primary intention of the SEPP is that any development should have a neutral or beneficial impact on water quality. For development requiring concurrence this must be demonstrated through the water cycle management study. Development requiring notification would need to similarly demonstrate that it would have at least a neutral impact on water quality.

The water cycle management study must address:

- runoff volumes and pollutant loads from the site before any development proceeds and what is anticipated during and after construction. These would need to be assessed for both wet and dry weather conditions;
- assessment of the proposal against the matters for consideration listed in clause 10;
- the impacts on receiving waters;
- the strategies and best management practices proposed to address the impacts on receiving waters; and
- the arrangements for ongoing management and maintenance of the water cycle management system.

The water cycle management study may require any or all of the following: the establishment of baseline water quality conditions; the application of documented previous experiences in water quality management; the theoretical application of best management practices; and modelling of impacts and control strategies using available data. The type of information required and level of analysis will be related to the nature, scale and location of the development and the issues raised during consultation with relevant agencies.

Consultation with relevant government agencies, including the Environment Protection Authority and the Department of Land and Water Conservation, is strongly encouraged by this clause. This may not be necessary in all cases, especially where the likely impacts on water quality are assessed as minimal. However, for developments which, due to their nature, scale or locality, could pose a significant threat to water quality, these consultations will assist the Chief Executive in making a decision whether or not to grant concurrence.

Government agencies may also be able to assist in providing information on best management practices for particular development proposals and water cycle management techniques. For designated development proposals PlanningNSW has a range of environmental assessment guidelines to assist applicants with their proposals.

Water quality and flow data to assist in establishing baseline conditions may be available from the Sydney Catchment Authority, Department of Land and Water Conservation, Environment Protection Authority, Catchment Management Committees, Sydney Water or local Councils.

The Sydney Catchment Authority has advised that it generally requires a minimum buffer distances between effluent disposal areas and waterways as follows:

- 40m from drainage depressions;
- 100m from both permanent and intermittent watercourses; and
- 150m from major rivers such as the Wollondilly, Wingecarribee, Nepean, Shoalhaven, Nattai and Coxs Rivers.

Clause 12: Notification of Chief Executive

This clause refers to development identified in Schedules 1 and 2 and indicates where notification rather than the concurrence of the Chief Executive is required. Notification is not required for State Significant Development.

Sufficient information must be provided with the application for the Chief Executive to assess the application. The minimum information required is:

- a description of the proposal and plans;
- a location plan (eg. Identified on 1:25000 topographic map);
- a site plan showing topographic details, and type and location of any effluent disposal areas; and

- site assessment incorporating soil profile, distance to watercourses, constraints to effluent disposal within the property.

Development Applications for development in Schedule 1 within the Shoalhaven catchment, and development in Schedule 2 within any catchment (other than the Special Areas and Kangaroo Valley Area), must be notified to the Chief Executive.

Development applications must be forwarded to the Chief Executive within 2 days of receipt. The Chief Executive has 21 days from receipt of the application in which to reply, and the consent authority must take into account any comments made by the Chief Executive when deciding whether or not to grant consent or when imposing conditions of consent.

The Chief Executive may extend the time in which to respond, especially if the development application is for advertised development or exhibited as for designated development and it is considered that viewing any submissions before responding may be helpful.

Summary of concurrence and notification provisions

The concurrence and notification provisions of the SEPP are summarised in the following table:

Concurrence and Notification Provisions

	Special Areas	Shoalhaven Catchment (but not Shoalhaven Special Area or KVA)	Kangaroo Valley Area (KVA)	All other areas
Notification Requirement	No	Schedule 1 and 2 development	No	Schedule 2 development
Concurrence Requirement	Schedule 1 and 2 development.	No	Schedule 1 and 2 development	Schedule 1 development

Where SEPP 58 does not apply and an LEP has an existing Water Board/Sydney Water concurrence requirement this concurrence must be obtained from the Chief Executive of the SCA. However, where SEPP 58 applies, then once an application has been forwarded the Chief Executive of the SCA for concurrence/notification under SEPP 58, separate referral under the LEP is not required.

Clause 12A: Copies of development consents to Chief Executive

Amendment No. 2 requires consent authorities to forward a copy of their determination of a development application for all developments which require concurrence or notification of the Chief Executive of the Sydney Catchment Authority under clause 11 or 12, even if the application has been refused.

Copies of determinations should be forwarded to the Chief Executive within 10 days subsequent to the decision.

This information will be placed in a register and used to review planning decisions and the effectiveness of the SEPP.

Clause 13: Prohibited development

This clause specifies that this policy does not apply to prohibited development. Where development is prohibited by an environmental planning instrument nothing in this SEPP makes it permissible and it remains prohibited.

Transitional Provisions

Clause 14: Application of Policy to certain development applications

This clause provides savings provisions for development applications that were lodged but not finally determined by 1 February 1999. A development application lodged before this date must be considered under the provisions of the planning instruments in place at the time of lodgement.

Clauses 15 & 16: Concurrence & Notification Provisions

Any development applications lodged before 31 March 2000 for which the concurrence or notification of the Director General is required, but which have not yet been dealt with by the Director General, become the responsibility of the Chief Executive of the SCA. The Chief Executive must respond within the normal timeframes of 21 days for notifications and 40 days for concurrence matters.

References

Healthy Rivers Commission of New South Wales, 1998. *Independent Inquiry into the Hawkesbury Nepean System*, Final Report August 1998.

Healthy Rivers Commission of New South Wales, 1999. *Independent Inquiry into the Hawkesbury Nepean River System*, Supplementary Report April 1999.

Healthy Rivers Commission of New South Wales, 1999. *Independent Inquiry into the Woronora River System*, Draft Report June 1999.

Healthy Rivers Commission of New South Wales, 1999. *Independent Inquiry into the Shoalhaven River System*, Final Report July 1999.

Appendix E Results of Database Searches



Australian Government
Department of the Environment and Heritage

Protected Matters Search Tool

You are here: [DEH Home](#) > [EPBC Act](#) > [Search](#)

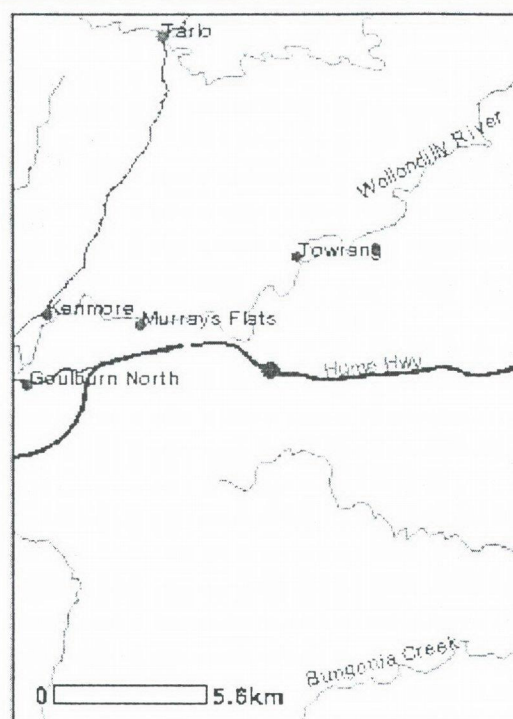
17 August 2004 14:25

EPBC Act Protected Matters Report

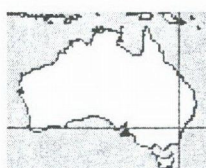
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected. Information on the coverage of this report and qualifications on data supporting this report are contained in the [caveat](#) at the end of the report.

You may wish to print this report for reference before moving to other pages or websites.

The Australian Natural Resources Atlas at <http://www.environment.gov.au/atlas> may provide further environmental information relevant to your selected area. Information about the EPBC Act including significance guidelines, forms and application process details can be found at <http://www.deh.gov.au/epbc/assessmentsapprovals/index.html>



Search Type: Point
Buffer: 10 km
Coordinates: -34.7431,149.84179



Summary

Report Contents:

Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see <http://www.deh.gov.au/epbc/assessmentsapprovals/guidelines/index.html>.

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Significance: (Ramsar Sites)	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	1
Threatened Species:	13
Migratory Species:	7

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place and the heritage values of a place on the Register of the National Estate. Information on the new heritage laws can be found at <http://www.deh.gov.au/heritage/index.html>.

Please note that the current dataset on Commonwealth land is not complete. Further information on Commonwealth land would need to be obtained from relevant sources including Commonwealth agencies, local agencies, and land tenure maps.

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at <http://www.deh.gov.au/epbc/permits/index.html>.

Commonwealth Lands:	1
Commonwealth Heritage Places:	None
Places on the RNE:	3
Listed Marine Species:	7
Whales and Other Cetaceans:	None

Critical Habitats: None

Commonwealth Reserves: None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves: None

Other Commonwealth Reserves: None

Regional Forest Agreements: None

Details

Matters of National Environmental Significance

Threatened Ecological Communities [[Dataset Information](#)]

Natural Temperate Grassland of the Southern Tablelands of NSW and the Australian Capital Territory

Status

Type of Presence

Endangered

Community likely to occur within area

Threatened Species [[Dataset Information](#)]

Status

Type of Presence

Birds

Lathamus discolor
Swift Parrot

Endangered

Species or species habitat may occur within area

Rostratula australis
Australian Painted Snipe

Vulnerable

Species or species habitat may occur within area

Xanthomyza phrygia
Regent Honeyeater

Endangered

Species or species habitat may occur within area

Fishes

Macquaria australasica *
Macquarie Perch

Endangered

Species or species habitat may occur within area

Prototroctes maraena *
Australian Grayling

Vulnerable

Species or species habitat likely to occur within area

Mammals

Chalinolobus dwyeri
Large-eared Pied Bat, Large Pied Bat

Vulnerable

Species or species habitat may occur within area

Dasyurus maculatus maculatus (SE mainland population)

Endangered

Species or species habitat likely to occur within area

Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population)

Petrogale penicillata
Brush-tailed Rock-wallaby

Vulnerable

Species or species habitat may occur within area

Pteropus poliocephalus
Grey-headed Flying-fox

Vulnerable

Species or species habitat likely to occur within area

Reptiles

Delma impar *
Striped Legless Lizard

Vulnerable

Species or species habitat likely to occur within area

Hoplocephalus bungaroides *
Broad-headed Snake

Vulnerable Species or species habitat likely to occur within area

Plants

Caladenia tessellata
Thick-lipped Spider-orchid, Daddy Long-legs

Vulnerable Species or species habitat likely to occur within area

Thesium australe
Austral Toadflax, Toadflax

Vulnerable Species or species habitat likely to occur within area

Migratory Species [Dataset Information]

Status Type of Presence

Migratory Terrestrial Species

Birds

Haliaeetus leucogaster
White-bellied Sea-Eagle

Migratory Species or species habitat likely to occur within area

Hirundapus caudacutus
White-throated Needletail

Migratory Species or species habitat may occur within area

Monarcha melanopsis
Black-faced Monarch

Migratory Breeding may occur within area

Myiagra cyanoleuca
Satin Flycatcher

Migratory Breeding likely to occur within area

Xanthomyza phrygia
Regent Honeyeater

Migratory Species or species habitat may occur within area

Migratory Wetland Species

Birds

Gallinago hardwickii
Latham's Snipe, Japanese Snipe

Migratory Species or species habitat may occur within area

Rostratula benghalensis s. lat.
Painted Snipe

Migratory Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Dataset Information]

Status Type of Presence

Birds

Gallinago hardwickii
Latham's Snipe, Japanese Snipe

Listed - overfly marine area Species or species habitat may occur within area

Haliaeetus leucogaster
White-bellied Sea-Eagle

Listed Species or species habitat likely to occur within area

Hirundapus caudacutus
White-throated Needletail

Listed - overfly marine area Species or species habitat may occur within area

Lathamus discolor
Swift Parrot

Listed - overfly marine area Species or species habitat may occur within area

Monarcha melanopsis
Black-faced Monarch

Listed - overfly marine area Breeding may occur within area

Myiagra cyanoleuca
Satin Flycatcher

Listed - Breeding likely to occur within area
overfly
marine
area

Rostratula benghalensis s. lat.
Painted Snipe

Listed - Species or species habitat may occur
overfly within area
marine
area

Commonwealth Lands [[Dataset Information](#)]

Communications, Information Technology and
the Arts - Telstra Corporation Limited

Places on the RNE [[Dataset Information](#)]

Note that not all Indigenous sites may be listed.

Historic

[Danganelly Farmhouse NSW](#)

[Towrang Bridge and Culverts NSW](#)

[Towrang Convict Stockade & Magazine NSW](#)

Caveat

The information presented in this report has been provided by a range of data sources as [acknowledged](#) at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the *Environment Protection and Biodiversity Conservation Act 1999*. It holds mapped locations of World Heritage and Register of National Estate properties, Wetlands of International Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under "type of presence". For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

Only selected species covered by the migratory and marine provisions of the Act have been mapped.

The following species and ecological communities have not been mapped and do not appear in

reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers.

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites;
- seals which have only been mapped for breeding sites near the Australian continent.

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Acknowledgments

This database has been compiled from a range of data sources. Environment Australia acknowledges the following custodians who have contributed valuable data and advice:

- New South Wales National Parks and Wildlife Service
- Department of Sustainability and Environment, Victoria
- Department of Primary Industries, Water and Environment, Tasmania
- Department of Environment and Heritage, South Australia Planning SA
- Parks and Wildlife Commission of the Northern Territory
- Environmental Protection Agency, Queensland
- Birds Australia
- Australian Bird and Bat Banding Scheme
- Australian National Wildlife Collection
- Natural history museums of Australia
- Queensland Herbarium
- National Herbarium of NSW
- Royal Botanic Gardens and National Herbarium of Victoria
- Tasmanian Herbarium
- State Herbarium of South Australia
- Northern Territory Herbarium
- Western Australian Herbarium
- Australian National Herbarium, Atherton and Canberra
- University of New England
- Other groups and individuals

ANUCLIM Version 1.8, Centre for Resource and Environmental Studies, Australian National University was used extensively for the production of draft maps of species distribution. Environment Australia is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Last updated:

Department of the Environment and Heritage
GPO Box 787 Canberra ACT 2601 Australia
Telephone: +61 (0)2 6274 1111

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Australian Heritage Database

Search Results

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71 results found.

Anglican Church Cemetery Hume Highway	via Goulburn, NSW	(Indicative Place) Register of the National Estate
Badgerys Lookout View	Tallong, NSW	(Indicative Place) Register of the National Estate
Bannaby Anglican Churchyard	Bannaby via Taralga, NSW	(Indicative Place) Register of the National Estate
Baxters House	Currawang via Collector, NSW	(Indicative Place) Register of the National Estate
Bishopthorpe Grabben Gullen Rd	Goulburn, NSW	(Indicative Place) Register of the National Estate
Black Springs Race	Nerriga, NSW	(Indicative Place) Register of the National Estate
Blue Mountains National Park (1980 boundary) Great Western Hwy	Glenbrook, NSW	(Registered) Register of the National Estate
Bungonia State Recreation Area Lookdown Rd	Bungonia, NSW	(Registered) Register of the National Estate
Burrungurroolung Garden Braidwood Rd	Tirrannaville, NSW	(Registered) Register of the National Estate
Burrungurroolung and Stables Braidwood Rd	Tirrannaville, NSW	(Registered) Register of the National Estate
Caarne Historic Site Lookdown Rd	Bungonia, NSW	(Registered) Register of the National Estate
Christ Church Anglican Cemetery Rhyanna Rd	Chatsbury via Goulburn, NSW	(Indicative Place) Register of the National Estate
Coopers Vault	Willeroo Station via Collector, NSW	(Indicative Place) Register of the National Estate
Crokers Mint	Nerriga, NSW	(Indicative Place) Register of the National Estate
Cunningham Family Cemetery Taralga Rd	via Goulburn, NSW	(Indicative Place) Register of the National Estate
Currawang House Currawang Rd	Currawang via Collector, NSW	(Indicative Place) Register of the

<u>Currawang Village</u>	Currawang via Collector, NSW	National Estate (Indicative Place) Register of the National Estate
<u>Danganelly Farmhouse</u> Greenwich Park Rd	Towrang, NSW	(Registered) Register of the National Estate
<u>Fernbank Mining Settlement (former)</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>George Street Streetscape</u> George St	Marulan, NSW	(Indicative Place) Register of the National Estate
<u>Glenrock Homestead, Stone Outbuildings, Grounds and Trees</u> Bundanoon Rd	Marulan, NSW	(Registered) Register of the National Estate
<u>Inverary Park</u> Inverary Rd	Bungonia, NSW	(Registered) Register of the National Estate
<u>Kippilaw Garden</u> Gurrundah Rd	Goulburn, NSW	(Registered) Register of the National Estate
<u>Kippilaw Homestead Group</u> Gurrundah Rd	Goulburn, NSW	(Registered) Register of the National Estate
<u>Lake Bathurst Public School (former)</u> Goulburn - Braidwood Rd	Lake Bathurst, NSW	(Registered) Register of the National Estate
<u>Lake George and Surrounds</u> Federal Hwy	Collector, NSW	(Rejected Place) Register of the National Estate
<u>Lockyersleigh</u>	via Towrang, NSW	(Registered) Register of the National Estate
<u>Lockyersleigh Garden</u>	via Towrang, NSW	(Registered) Register of the National Estate
<u>Long Gully Mining Area</u>	Bungonia, NSW	(Registered) Register of the National Estate
<u>Lumley Park Homestead, Outbuildings and Curtilage</u> Windellama Rd	Bungonia, NSW	(Registered) Register of the National Estate
<u>Mantons Reef (Village, Battery and Mine Site)</u>	via Bungonia, NSW	(Indicative Place) Register of the National Estate
<u>Merrilla Uniting Church Cemetery</u> Gurrundah Rd	Goulburn, NSW	(Indicative Place) Register of the National Estate
<u>Minda Eucalyptus Site</u> Nerriga Rd	Windellama via Bungonia, NSW	(Indicative Place) Register of the National Estate
<u>Morton National Park (1980 boundary)</u>	Bundanoon, NSW	(Registered) Register of the National Estate
<u>Mummell Catholic Cemetery</u> Grabben Gullen Rd	Mummell via Goulburn, NSW	(Indicative Place) Register of the

Tarago Railway Station Goulburn - Braidwood Rd	Tarago, NSW	National Estate (Registered) Register of the National Estate
Taralga Courthouse (former) Orchard St	Taralga, NSW	(Registered) Register of the National Estate
Taralga War Memorial Orchard St	Taralga, NSW	(Indicative Place) Register of the National Estate
Tarlo River National Park (1991 boundary)	Taralga, NSW	(Registered) Register of the National Estate
The Blue Mountains	Katoomba, NSW	(Indicative Place) Register of the National Estate
The Greater Blue Mountains Area Geat Western Hwy	Katoomba, NSW	(Declared property) World Heritage List
The Greater Blue Mountains Area	Katoomba, NSW	(Indicative place) National Heritage List
Tirranna - Gibson Family Cemetery Braidwood Rd	Tirrannaville, NSW	(Registered) Register of the National Estate
Tirranna Original Garden Remains Braidwood Rd	Tirrannaville, NSW	(Registered) Register of the National Estate
Tirranna, Garden, Farm Complex and Cemetery. Braidwood Rd	Tirrannaville, NSW	(Registered) Register of the National Estate
Towrang Bridge and Culverts Hume Hwy	Towrang, NSW	(Registered) Register of the National Estate
Towrang Convict Stockade & Magazine Hume Hwy	Towrang, NSW	(Registered) Register of the National Estate
Towrang Stockade Graves Hume Hwy	Towrang, NSW	(Indicative Place) Register of the National Estate
Wollogorang Garden Hume Hwy	via Breadalbane, NSW	(Registered) Register of the National Estate
Wollogorang and Stable Block Hume Hwy	via Breadalbane, NSW	(Registered) Register of the National Estate
Wombeyan Caves Area Wombeyan Caves Rd	Taralga, NSW	(Interim List) Register of the National Estate
Yellow Springs Sluicing Site	Nerriga, NSW	(Indicative Place) Register of the National Estate

Report Produced: Mon Aug 16 17:09:33 2004

<u>Nadgigomar Dam Mining Site</u>	Sandy Point, NSW	National Estate (Indicative Place) Register of the National Estate
<u>New Come Up Ridge Mining Area</u>	Bungonia, NSW	(Indicative Place) Register of the National Estate
<u>Norwood Middle Arm Rd</u>	Goulburn, NSW	(Registered) Register of the National Estate
<u>Oallen Dam Oallen Nerriga Rd</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Oallen Treasury Oallen Nerriga Rd</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Old Marulan Anglican Church Cemetery Bungonia Rd</u>	Marulan, NSW	(Indicative Place) Register of the National Estate
<u>Old Marulan Catholic Cemetery Hume Hwy</u>	Marulan, NSW	(Indicative Place) Register of the National Estate
<u>Rossi Bridge Grabben Gullen Rd</u>	Goulburn, NSW	(Registered) Register of the National Estate
<u>Sewells Point Sluicing Site</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Spa Historic Area</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Spring Creek Bungonia Historic Area Spring Ridge Rd</u>	Bungonia, NSW	(Registered) Register of the National Estate
<u>Spring Creek Hotel Site</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Spring Creek Mining Area (Including Blanketburn Gully)</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Spring Creek Oallen Historic Area</u>	Nerriga, NSW	(Indicative Place) Register of the National Estate
<u>Springfield Homestead, Outbuildings and Garden Braidwood Rd</u>	Goulburn, NSW	(Indicative Place) Register of the National Estate
<u>St James Anglican Church Cemetery Gurrundah Rd</u>	Goulburn, NSW	(Registered) Register of the National Estate
<u>St James Chapel on Kippilaw Gurrundah Rd</u>	Goulburn, NSW	(Registered) Register of the National Estate
<u>Stonequarry General Cemetery Golspie Rd</u>	Taralga, NSW	(Indicative Place) Register of the National Estate
<u>Tallong Public Recreation Reserve Old Wingello Rd</u>	Tallong, NSW	(Indicative Place) Register of the



Helping the community to recognise our heritage



NSW
Heritage
Office

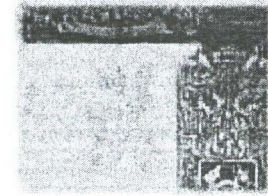
- About the Heritage Office
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- Historical Archaeology
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- Natural Heritage

Listing Heritage Items

► State Heritage Inventory Search Results



Statutory Listed Items

Information and items listed in the State Heritage Inventory come from a number of sources. This means that there may be several entries for the same heritage item in the database. For clarity, the search results have been divided into two sections.

- The first section contains items listed on the State Heritage Register, covered by an Interim Heritage Order or protected under section 130 of the NSW Heritage Act. This information is provided by the NSW Heritage Office.
- The second section contains items listed by Local Councils & Shires and State Government Agencies. This section may also contain additional information on some of the items listed in the first section.

Mayfield - Welcome Reef Dam	Mayfield Road	Lower Boro	Mulwaree	Yes
Ooranook - Welcome Reef Dam	Mayfield-Charleyong Road	Stewarts Crossing	Mulwaree	Yes
Rossis Bridge over Wollondilly River	Main Road 248	Goulburn	Mulwaree	Yes
Tallong Railway Station, yard and water supply	Main Southern railway	Tallong	Mulwaree	Yes
Tarago Railway Station group	Goulburn-Bombala railway	Tarago	Mulwaree	Yes
Whole of township	Multiples	Marulan	Mulwaree	Yes

There were **11** records in this section matching your search criteria.

Section 2. Items listed by Local Government and State agencies.

Item Name (sort)	Address (sort)	Suburb (sort)	LGA (sort)	Information Source (sort)
Marulan Station And Yard Group		Marulan	Mulwaree	SGOV
St Matthew's Church		Bannaby	Mulwaree	LGOV
Tallong Station, Yard And Water Supply		Tallong	Mulwaree	SGOV

There were **3** records in this section matching your search criteria.

There was a total of **14** records matching your search criteria.

Key:

LGA = Local Government Area

GAZ= NSW Government Gazette (statutory listings prior to 1997), HGA = Heritage Grant Application, HS = Heritage Study, LGOV = Local Government, SGOV = State Government Agency.

Note: The Heritage Office seeks to keep the State Heritage Inventory (SHI) up to date, however the latest listings in Local and Regional Environmental Plans (LEPs and REPs) may not yet be included. Always check with the relevant Local Council or Shire for the most recent listings.



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- [3 Land to which plan applies](#)
- [4 Relationship to other environmental planning instruments](#)
- [5 Interpretation](#)
- [6 Adoption of Model Provisions](#)
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Part 2 Zones

- [8 Zones indicated on the map](#)
- [9 Zone objectives and development control table](#)

Part 3 Special provisions

- [10 General considerations for development](#)
- [11 Subdivision of land generally](#)
- [12 Subdivision of land for the purposes of dwelling-houses within Zone No 1 \(a\), 1 \(b\), 7 \(a\) or 7 \(b\)](#)
- [13 Subdivision for other purposes within Zone No 1 \(a\), 1 \(b\), 7 \(a\) or 7 \(b\)](#)
- [14 Subdivision for the purposes of dwelling-houses within Zone No 1 \(c\)](#)
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Mulwaree Local Environmental Plan 1995

Schedule 1 Heritage items

(Clause 5)

Item	Land description
1	Hillas Farm Homestead and Outbuildings
2	St Matthews Church, Bannaby

Lot 1 in DP 598080 Parish of Bunnaby, County of Argyle
Part Lot 7 in DP 750001

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Southern region

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Southern Region

Abernethys Creek Bridge	4309517
Avenue of Norfolk Pines (1900 metres)	4301401
Bellbird Creek Bridge	4309550
Bridge over Wologorong Creek	4301637
Butlers Creek Bridge	4301638
Charleyong Bridge over Mongarlowe River	4300172
Collection of movable heritage items - machinery and related equipment	4301432
Collection of movable heritage items - machinery and related equipment	4301434
Collection of movable items - photographs, surveyors books and equipment etc.)	4301444
Collection of movable items - surveyors equipment and field books.	4301458
Collection of plans of roads and bridges for the Southern Region.	4301456
Collection of surveyors folders / books and photographs	4301457
Crankies Plain Bridge, Bombala	4300006
Crookwell River Bridge	4309559
Dalgety Bridge over Snowy River	4301689
Fairy Creek Bridge	4309514
Gundaroo Bridge over Yass River at Gundaroo	4300157
Guthries Creek Bridge	4309555
Hampden Bridge, Kangaroo Valley	4301059
Heritage horse trough	4301454
Higgins Creek Bridge	4309518
House - 85 Farrell Road, Bulli	4301086
Lansdowne Bridge over Mulwaree Ponds	4300186
Large collection of movable heritage in the Mittagong Works Office	4301452
Large collection of movable heritage items - surveying and miscellaneous	4301431
Movable collection - machinery	4301437
Movable collection - other	4301438
Narooma Bridge	4300639
New Buildings Bridge over Towamba River	4300139
Nowra Bridge over the Shoalhaven River	4301658
Old Marulan Town	4300302
Rossis Bridge 4.5Km NW of Goulburn	4300156
Sections of shoalhaven bridge	4301446
Slacks Creek Bridge	4309554
Spencers Creek Bridge	4309556
Stone lined channel outlet from Murray Lagoon, Federal Highway	4301028
Survey collection - field records and equipment	4301455

In This Section

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- ▣ [Northern region](#)
- ▣ [South West region](#)
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Truss Bridge over Crookwell River	4300130
Victoria Bridge over Stonequarry Creek, Picton	4301089
Yowaka Bridge near Eden	4300515

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Your Ref: 21072004
Our Ref: AHIMS #10409

RTA - Environmental Technology
P O Box 3035
Parramatta NSW 2124

Tuesday, 27 July 2004

Attention: Trent Williams

Dear Sir or Madam:

**Re: AHIMS Search for the following area at North of Goulburn
Zone 55 Eastings: 757500-762500 Northings: 6148811-6153811**

**NSW
NATIONAL
PARKS AND
WILDLIFE
SERVICE**

NPWS is part of
the Department of
Environment and
Conservation

ABN 30 841 387 271

I am writing in response to your recent inquiry in respect to Aboriginal objects and Aboriginal places registered with the NSW National Parks and Wildlife Service (NPWS) at the above location.

A search of the NPWS Aboriginal Heritage Information Management System (AHIMS) has shown that 3 Aboriginal objects and Aboriginal places are recorded in or near the above location. Please refer to the attached report for details.

The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not to be made available to the public.

The following qualifications apply to an AHIMS search:

- AHIMS only includes information on Aboriginal objects and Aboriginal places that have been provided to NPWS;
- Large areas of New South Wales have not been the subject of systematic survey or recording of Aboriginal history. These areas may contain Aboriginal objects and other heritage values which are not recorded on AHIMS;
- Recordings are provided from a variety of sources and may be variable in their accuracy. When an AHIMS search identifies Aboriginal objects in or near the area it is recommended that the exact location of the Aboriginal object be determined by re-location on the ground; and
- The criteria used to search AHIMS are derived from the information provided by the client and NPWS assumes that this information is accurate.

All Aboriginal places and Aboriginal objects are protected under the *National Parks and Wildlife Act 1974* (NPW Act) and it is an offence to destroy, damage or deface them without the prior consent of the NPWS Director-General. An Aboriginal object is considered to be known if:

- It is registered on AHIMS;
- It is known to the Aboriginal community; or
- It is located during an investigation of the area conducted for a development application.

If you considering undertaking a development activity in the area subject to the AHIMS search, NPWS would recommend that an Aboriginal Heritage Assessment be

43 Bridge Street
PO Box 1967
Hurstville NSW
1481 Australia

Tel: (02) 9585 6444
Fax: (02) 9585 6555

www.nationalparks.nsw.gov.au

undertaken. You should consult with the relevant consent authority to determine the necessary assessment to accompany your development application.

Yours Sincerely

A handwritten signature in black ink, appearing to be 'D. Gordon', written over a horizontal line.

David Gordon
Acting AHIMS Administrator
Information Systems Unit
Cultural Heritage Division
Phone: (02) 9585 6513
Fax: (02) 9585 6094

AHIMS

Aboriginal Heritage Information Management System

List of Sites (List - Short)

Goulburn

Grid Reference Type = AMG Zone = 55 Easting From = 757500 Easting to = 762500 Northing From = 6148111 Northing to = 6153811 Requestor = RTA - Environment Technology/Parramatta (3605) Service ID = 10409 Feature Search Type = AHIMS Features

WBS

H/43917/A/01

Please plot. Thanks.

Yojana

Site ID	Site Name	Grid.Ref	Zone	Eastng	Northing	Site Features	Site Types	Recording	Reports
51-6-0058	Boxer Creek Tributary	AMG	55	757790	6153490	AFT,	Open Camp Site		
		Status Valid							
		Primary Contact							
51-6-0069	G05	AMG	55	759150	6152150	AFT,	Open Camp Site	McIntyre,S (01-JAN-89)	
		Status Valid							
		Primary Contact							
51-6-0115	Wollondilly River	AMG	55	759620	6153560	AFT,		Edmonds,V (21-SEP-99)	
		Status Valid							
		Primary Contact							

NATIONAL NATIVE TITLE TRIBUNAL

Level 25 GPO Box 9973, SYDNEY NSW 2001
25 Bligh Street Telephone: (02) 9235 6300
SYDNEY NSW 2000 Facsimile: (02) 9233 5613
AUSTRALIA Website: www.nntt.gov.au

Our Ref: 874/04af
Your Ref: 4M3077

Trent Williams
Environmental Officer
Roads & Traffic Authority
PO Box 3035
Parramatta NSW 2124

21 July 2004

Dear Mr Williams

Native title search results of Mulwaree Local Government Area

Thank you for your letter of 21 July 2004.

My search on 21 July 2004 found:

Register Type	NNTT Reference Numbers
National Native Title Register	Nil.
Register of Native Title Claims	NC97/7, NC00/1.
Unregistered Claimant applications	Nil.
Register of Indigenous Land Use Agreements	Nil.

I have included more detailed information and a fact sheet to help you understand the search result.

Please note, recent applications lodged or amended in the Federal Court may not have been sent to us.

If you need more information please call me on (02) 9235 6300.

Yours sincerely



Amy Fitzell
Administration Assistant

874/04 A

NATIONAL NATIVE TITLE TRIBUNAL

Search request form



Your details:

Name: ...Trent Williams.....Mr

Company/organisation: ...Roads and Traffic Authority.....

Position: ...Environmental Officer.....Your reference: ...4M3077.....

Address: ...PO Box 3035 Parramatta NSW 2124.....

Postcode: ...2124.....

Tel: (02) 8837 0593.....Fax: (02) 8837 0053...Email: trent_Williams@rta.nsw.gov.au

How long will the search take?

A search of the Tribunal Registers is a search to ascertain whether there is a native title determination, claim or land use agreement over a specified area. A search of the Registers may take between three and five working days. We will contact you if a result cannot be provided within this timeframe.

How much does a search cost?

We are unable to give estimates of costs for individual searches. A guide is \$22.00 for a search where you provide us with the Tribunal/Federal Court file number or name. Charges are applied at a rate of \$21.45 for the first 15 minutes of searching and \$7.15 each 5 minutes thereafter, plus postage/courier costs. Photocopy charges are 50c per page. In some complex cases, specialist geospatial skills may be required to address the relationship between native title boundaries and the search area. The average cost of geospatial analysis is \$79.20 per hour. This charge will be included in the total cost of the search. All charges include GST.

Please do not send any monies or cheques before the search is completed. The Tribunal will send you an invoice.

To help determine whether charges apply, tick the appropriate box if you are:

- ☐ a party to a native title application (or their legal representative) — please provide the Federal Court or Tribunal file number or name
- ☐ an interest holder in the area of the search and intend to become a party to an application in that area
- ☐ a party to native title negotiations related to indigenous land use agreements (ILUAs), objection to ILUA or statutory access (or their legal representative)
- ☒ an officer of a State or Territory government organisation
- ☐ unable to pay due to financial hardship (The Tribunal will require some evidence of your financial position, for example, a Commonwealth health care or concession card.)

How would you like to receive the search results and invoice (if applicable)?

- ☒ Post
- ☐ Fax — large attachments, such as maps, can not be faxed with search results
- ☐ Email — attachments such as maps (if any) can not be emailed with search results
- ☐ Courier

go to page 2

Request details:

Date of request: 21/07/2004..... When are the results required by? 8/08/2004.....

Is there a reason this request should receive priority? (For example: Court order, mediation etc):

.....
We will contact you if this timeframe cannot be met.

Federal Court/Tribunal file number/application name (if known):

Details of area to be searched

Please complete at least one of the following description fields or provide a clear map of the area including landmarks:

Mining Tenement or block/sub block description:

OR Land parcel (Northern Territory):

Lot:Town:

Section:Hundred:

Northern Territory Portion:

Pastoral Lease number or name:

OR Land parcel (other):

Lot number(s):

Property name:

Tenure (for example, agricultural lease):

Shire(s): **Mulwaree, Goulburn, Crookwell**

Parish:

County:

Town:

State/Territory: **...New South Wales**

Other details (additional information may be attached):

The particular area is 12km north of Goulburn along the Hume Highway (refer to attached map).

Fax, mail or email the completed form to the:

National Native Title Tribunal
GPO Box 9973 in your capital city

Fax: WA: (08) 9221 7158

NSW: (02) 9233 5613

Vic/Tas: (03) 9606 0680

NT: (08) 8981 7982

Freecall: 1800 640 501

Email: info@nntt.gov.au

Brisbane: (07) 3226 8235

Cairns: (07) 4051 3660

SA: (08) 8224 0939

Privacy notice

We are authorised under the *Native Title Act 1993* (Cth) to collect this information. We will use the information you provide to process your register search request. We do not disclose the information you give us to others. If there is a request for your personal information under another law of the Commonwealth or a state, we may need to disclose your information to a court or to another Commonwealth agency or other persons as required or authorised by law.

Tribunal use only:

☐ fee exemption

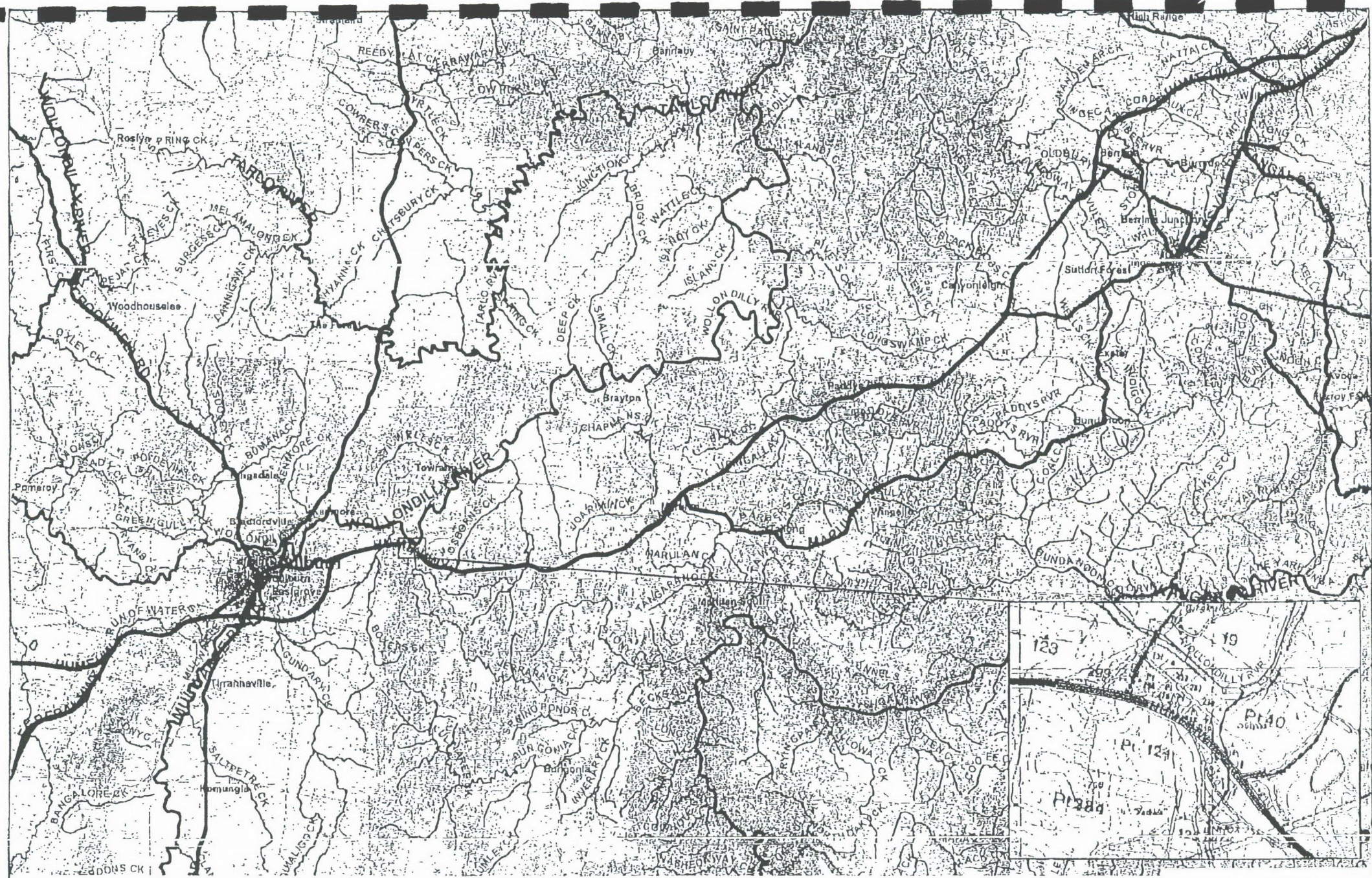
☐ request completed

☐ assistance recorded

☐ geospatial request — client contacted on (date):

☐ invoice generated on (date):

searchrequestform191203



Hume Highway
Location of Proposed Improvements
to Junctions at Towrang and Carrick Roads



LEGEND

 Proposed Works



NATIONAL NATIVE TITLE TRIBUNAL

Claimant Application Summary

Application numbers	Federal Court number: NG6060/98 NNTT number: NC97/7
Application name	Gundungurra Tribal Council Aboriginal Corporation #6
Name of body where application lodged	National Native Title Tribunal
Date application lodged	29/04/1997
Current stage(s)	Notification Complete, In Mediation
Applicants	Ms Elsie Stockwell, Ms Pamela Stockwell
Address for service	Mr Eduard Neumann Craddock Murray and Neumann Level 2 255 Castlereagh Street SYDNEY NSW 2000 Phone: 02 9283 4755 Fax: 02 9283 4180
Persons claiming to hold native title	The members of the Gundungurra Tribal Council Aboriginal Corporation
Native title rights and interests claimed	1. Subject to (2) - (5) below, the full and free enjoyment of the following native title rights and interests area are claimed in relation to the land and waters the subject of the application: a. A right to possess, occupy, use and enjoy the claim area; b. A right to make decisions about the use and enjoyment of the claim area; c. A right of access to the claimed area; d. A right to control the access of others to the claimed area; e. The right to control the use and enjoyment of others or resources of the claimed area; f. The right to trade in resources of the claimed area; g. The right to receive a portion of any resources taken by others from the claimed area; h. The right to maintain, protect and prevent the misuse of cultural knowledge of the common law holders associated with the claimed area. 2. With respect of those parts of the area the subject of the application which are, or have been, the subject of a previous non-exclusive possession act within the meaning of s 23F of the Native Title Act 1993, the native title rights and interests area set out in (1) are claimed subject to the rights and interests created in the 'non-exclusive possession act' which are not inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause. 3. With respect to those parts of the area the subject of the application which are, or have been, the subject of:

	a. a category B intermediate period act within the meaning of s232C of the Native Title Act 1993; b. a category C intermediate period act within the meaning of s232D of the Native Title Act 1993; c. a category D intermediate period act within the meaning of s232E of the Native Title Act 1993; the native title rights and interests claimed are those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause. 4. With respect to those parts of the area of the application which are, or have been, the subject of: a. a category B past act within the meaning of s230 of the Native Title Act 1993; b. a category C past act within the meaning of s231 of the Native Title Act 1993; c. a category D past act within the meaning of s232 of the Native Title Act 1993; the native title rights and interests claimed area those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any extinguishment or suspension of the native title rights and interests which those inconsistent rights and interests cause. 5. The native title rights and interests identified above do not extend to ownership of any minerals, petroleum or gas which are wholly owned by the Crown. 6. The native title rights and interests identified above do not include a claim for exclusive occupation and use of offshore areas as defined by s253 of the Native Title Act 1993.
--	---

Area	Jurisdiction: New South Wales Location: Land and waters in the area from the Blue Mountains south to Goulburn, following the Lachlan River west to Newbridge and then north to Mt Davidson. Local government region(s): Bathurst City Council, Blayney Shire Council, Blue Mountains City Council, Boorowa Shire Council, Camden Council, Campbelltown City Council, Cowra Shire Council, Upper Lachlan Council, Evans Shire Council, Goulburn City Council, Lithgow City Council, Gunning Shire Council, Liverpool City Council, Mulwaree Shire Council, Oberon Council, Penrith City Council, Tallaganda Shire Council, Wingecarribee Shire Council, Wollondilly Shire Council ATSIC region(s): Binaal Billa Regional Council, Sydney Regional Council, Queanbeyan Regional Council Representative A/TSI body(s): NSW Native Title Services Ltd Land/water and/or sea: Land/Water Area covered by the claim (as detailed in the application): (a) Commencing at 150.52997 east longitude and 34.591636 south latitude, approximately 15.5 kilometres east south east of Moss Vale, the application traverses clockwise starting in a south-westerly direction, passing through points 2 to 36,765 of the following geographic coordinates. They are in decimal degrees and referenced to Australian Geodetic Datum 1984 (AGD84). These coordinates are based on the position of spatial reference data sourced by Land Information Centre, Department of Information Management and Technology, New South Wales as of 18 May 1999. (b) Subject to clauses (d) and (e) the area covered by the application excludes any land or waters covered by:
------	---

- (i) a scheduled interest;
- (ii) freehold estate;
- (iii) a commercial lease that is neither an agricultural lease nor a pastoral lease;
- (iv) an exclusive agricultural lease or an exclusive pastoral lease;
- (v) residential lease;
- (vi) a community purposes lease;
- (vii) a lease dissected from a mining lease as referred to in s23B(2)(vii);
- (viii) any lease (other than a mining lease) that confers a right of exclusive use over particular land or waters;

which was validly vested or granted on or before 23 December 1996.

(c) Subject to clauses (d) and (e) the area covered by the application excludes any area covered by the valid construction or establishment of any public work, where the construction or establishment of the public work commenced on or before 23 December 1996.

(d) Where the act specified in (b) and (c) falls within the provisions of

- (i) s23B(9) - Exclusion of acts benefiting Aboriginal peoples or Torres Strait Islanders;
- (ii) s23B (9A) - Establishment of a national or state park;
- (iii) s23B (9B) - Acts where legislation provides for non-extinguishment;
- (iv) s23B (9C) - Exclusion of Crown to Crown grants; and
- (v) s23B (10) - Exclusion by regulation,

the area covered by the act is not excluded from this application.

(e) Where an act referred to in clauses (b) and (c) covers land or waters referred to in:

- s47 - Pastoral leases held by native title claimants;
- s47A - Reserves etc covered by claimant applications; and
- s47B - Vacant crown land covered by claimant applications,

the area covered by the act is not excluded from the application.

(f) Where an area is covered by a previous non-exclusive possession act (s 23F) the native title claim group does not claim possession, occupation, use and enjoyment to the exclusion of all others.

(g) The area covered by the application excludes land where native title has been extinguished at common law.

(h) The area covered by the application excludes areas covered by prior Gundungurra claims filed with the National Native Title Tribunal being NC96/7, NC96/27, NC96/30, NC96/36 and 97/4.

Registration information

Please refer to the Register of Native Title Claims/National Native Title Register (as appropriate) for registered details of this application.

Date claim entered on Register of Native Title Claims:

29/04/1997

Registration test status:

Accepted for registration

Registration history:

Registered from 29/04/1997.

Attachments

1. Plan of Application Area, Attachment A of the Application, 1 page - A4, Attached 29/04/1997.

NNTT contact details	<table><tr><td data-bbox="518 35 766 291">Case manager:</td><td data-bbox="766 35 1516 291">Nicole Maher</td></tr><tr><td data-bbox="518 291 766 436">Address:</td><td data-bbox="766 291 1516 436">National Native Title Tribunal Level 25 25 Bligh Street SYDNEY NSW 2000 GPO Box 9973 SYDNEY NSW 2001</td></tr><tr><td data-bbox="518 436 766 459">Phone:</td><td data-bbox="766 436 1516 459">(02) 9235 6300</td></tr><tr><td data-bbox="518 436 766 459">Fax:</td><td data-bbox="766 436 1516 459">Freecall 1800 640 501</td></tr><tr><td data-bbox="518 436 766 459">Web page:</td><td data-bbox="766 436 1516 459">(02) 9233 5613 www.nntt.gov.au</td></tr></table>	Case manager:	Nicole Maher	Address:	National Native Title Tribunal Level 25 25 Bligh Street SYDNEY NSW 2000 GPO Box 9973 SYDNEY NSW 2001	Phone:	(02) 9235 6300	Fax:	Freecall 1800 640 501	Web page:	(02) 9233 5613 www.nntt.gov.au
Case manager:	Nicole Maher										
Address:	National Native Title Tribunal Level 25 25 Bligh Street SYDNEY NSW 2000 GPO Box 9973 SYDNEY NSW 2001										
Phone:	(02) 9235 6300										
Fax:	Freecall 1800 640 501										
Web page:	(02) 9233 5613 www.nntt.gov.au										



NATIONAL NATIVE TITLE TRIBUNAL

Application Information and Extract from the Register of Native Title Claims

Application Information

Application numbers:	Federal Court number:	NG6060/98
	NNTT number:	NC97/7
Application name:	Gundungurra #6	
Registration history:	Registered from 29/04/1997.	

Register Extract (pursuant to s.186 of the *Native Title Act 1993*)

Application lodged with:	National Native Title Tribunal
Date application lodged:	29/04/1997
Date claim entered on Register:	29/04/1997
Applicants:	Ms Elsie Stockwell, Ms Pamela Stockwell
Address for service:	Mr Eduard Neumann Craddock Murray and Neumann Level 2 255 Castlereagh Street SYDNEY NSW 2000 Phone: 02 9283 4755 Fax: 02 9283 4180

Area covered by the claim:

(a) Commencing at 150.52997 east longitude and 34.591636 south latitude, approximately 15.5 kilometres east south east of Moss Vale, the application traverses clockwise starting in a south-westerly direction, passing through points 2 to 36,765 of the following geographic coordinates [forming part of Attachment "B" of the application]. They are in decimal degrees and referenced to Australian Geodetic Datum 1984 (AGD84). These coordinates are based on the position of spatial reference data sourced by Land

(b) Subject to clauses (d) and (e) the area covered by the application excludes any land or waters covered by:

- (i) a scheduled interest;
- (ii) freehold estate;
- (iii) a commercial lease that is neither an agricultural lease nor a pastoral lease;
- (iv) an exclusive agricultural lease or an exclusive pastoral lease;
- (v) residential lease;
- (vi) a community purposes lease;
- (vii) a lease dissected from a mining lease as referred to in s23B(2)(vii);
- (viii) any lease (other than a mining lease) that confers a right of exclusive use over particular land or waters;

which was validly vested or granted on or before 23 December 1996.

(c) Subject to clauses (d) and (e) the area covered by the application excludes any area covered by the valid construction or establishment of any public work, where the construction or establishment of the public work commenced on or before 23 December 1996.

(d) Where the act specified in (b) and (c) falls within the provisions of

- (i) s23B(9) - Exclusion of acts benefiting Aboriginal peoples or Torres Strait Islanders;
- (ii) s23B (9A) - Establishment of a national or state park;
- (iii) s23B (9B) - Acts where legislation provides for non-extinguishment;
- (iv) s23B (9C) - Exclusion of Crown to Crown grants; and
- (v) s23B (10) - Exclusion by regulation,

the area covered by the act is not excluded from this application.

(e) Where an act referred to in clauses (b) and (c) covers land or waters referred to in:

- s47 - Pastoral leases held by native title claimants;
- s47A - Reserves etc covered by claimant applications; and
- s47B - Vacant crown land covered by claimant applications,

the area covered by the act is not excluded from the application.

(f) Where an area is covered by a previous non-exclusive possession act (s 23F) the native title claim group does not claim possession, occupation, use and enjoyment to the exclusion of all others.

(g) The area covered by the application excludes land where native title has been extinguished at common law.

(h) The area covered by the application excludes areas covered by prior Gundungurra claims filed with the National Native Title Tribunal being NC96/7, NC96/27, NC96/30, NC96/36 and 97/4.

Persons claiming to hold native title:

The members of the Gundungurra Tribal Council Aboriginal Corporation

Registered native title rights and interests:

The following Native Title Rights & Interests were entered on the Register on 23/06/2000:

1. Subject to (2) - (5) below, the full and free enjoyment of the following native title rights and interests area are claimed in relation to the land and waters the subject of the application:

- a. A right to possess, occupy, use and enjoy the claim area;
- b. A right to make decisions about the use and enjoyment of the claim area;
- c. A right of access to the claimed area;
- d. A right to control the access of others to the claimed area;
- e. The right to control the use and enjoyment of others of resources of the claimed area.

2. With respect of those parts of the area the subject of the application which are, or have been, the subject of a previous non-exclusive possession act within the meaning of s 23F of the Native Title Act 1993, the native title rights and interests area set out in (1) are claimed subject to the rights and interests created in the 'non-exclusive possession act' which are not inconsistent with the rights and interests claimed and, in the case of rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.

3. With respect to those parts of the area the subject of the application which are, or have been, the subject of:

- a. a category B intermediate period act within the meaning of s232C of the Native Title Act 1993;
- b. a category C intermediate period act within the meaning of s232D of the Native Title Act 1993;
- c. a category D intermediate period act within the meaning of s232E of the Native Title Act 1993;

the native title rights and interests claimed are those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any suspension of the native title rights and interests which those inconsistent rights and interests cause.

4. With respect to those parts of the area of the application which are, or have been, the subject of:

- a. a category B past act within the meaning of s230 of the Native Title Act 1993;
- b. a category C past act within the meaning of s231 of the Native Title Act 1993;
- c. a category D past act within the meaning of s232 of the Native Title Act 1993;

the native title rights and interests claimed area those set out in (1) above subject to the rights and interests created in the non-exclusive possession act which are not inconsistent with the rights and interests claimed

and, in the case of any rights granted which are inconsistent with the rights and interests claimed, subject to any extinguishment or suspension of the native title rights and interests which those inconsistent rights and interests cause.

5. The native title rights and interests identified above do not extend to ownership of any minerals, petroleum or gas which are wholly owned by the Crown.

6. The native title rights and interests identified above do not include a claim for exclusive occupation and use of offshore areas as defined by s253 of the Native Title Act 1993.

Register attachments:

1. Attachment "A" : Map of Application Area, 1 page - A4, Attached 23/06/2000.

Note: The Register may, in accordance with s.188 of the Native Title Act 1993, contain confidential information that will not appear on the Extract.

NATIVE TITLE APPLICATION

as at 18/05/1999

Map created from data sourced from Land Information Centre, DIM&T, NSW
by Geospatial Information Unit, National Native Title Tribunal

NC97/007 (NG6060/98)

Gundungurra #6

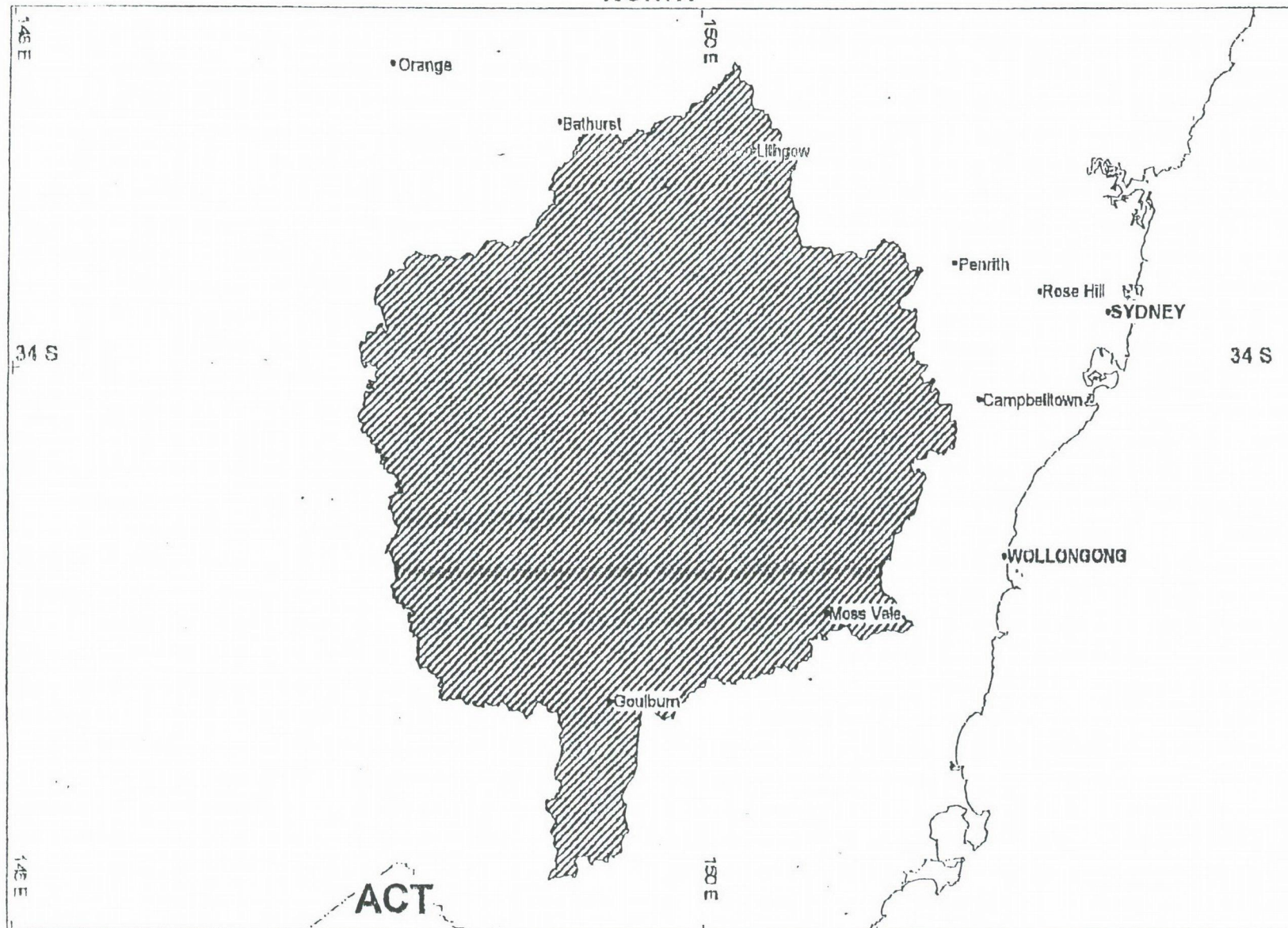
Application Area = 18682.37 sqkm

0 60

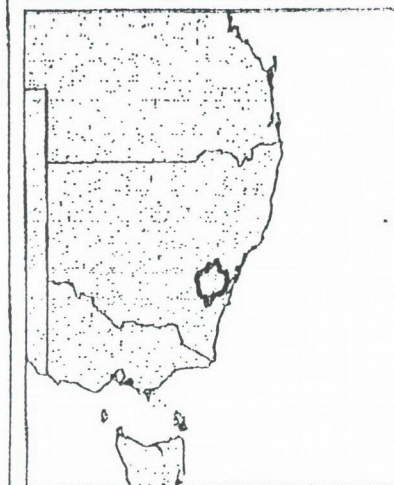
KILOMETRES

Latitude and Longitude based on Australian Geodetic Datum 1984

NORTH



Location of NC97/007
Within New South Wales & ACT





NATIONAL NATIVE TITLE TRIBUNAL

Claimant Application Summary

Application numbers	Federal Court number: N6001/00 NNTT number: NC00/1
Application name	Donald Thomas Bell on Behalf of the Ngunawal People (Ngunawal People (NSW))
Name of body where application filed	Federal Court of Australia
Date application filed	02/03/2000
Current stage(s)	Notification Complete, In Mediation
Applicants	Mr Donald Thomas Bell
Address for service	Dean Bell 11 Berger Street SOUTH WINDSOR NSW 2756
Persons claiming to hold native title	The claim is brought on behalf of the people listed below and their children:; Donald Thomas Bell, Erin Bell, Dean Bell, Merekai Bell, Danicka Bell, Tiara Biggs, Raymond Brydon, Caitlin Brydon, Darrell Brydon, Robert Brydon, Emily Brydon, Leesa Brydon, Jacob Brydon, Jordanne Brydon, Jeremy Brydon, Joshua Brydon, Samantha Brydon, Dawn Brydon, Deborah Brydon, Gavin Brydon, Angela Brydon, Brett Brydon, Andrew Brydon, Amanda Brydon, Malcolm Brydon, Dorothy Carroll, Darroll Charles Tighe, Phyllis Gertrude Carroll, Nicole Hall, Mitchell Hall, Barry Honeysett, Pamela Honeysett, Kaziah Honeysett, Curtis Honeysett, Darryl Honeysett, Lucille Honeysett, Dean Honeysett, Donna Honeysett, Dwayne Honeysett, James Honeysett, Angela Honeysett, Gordon Honeysett, Colleen Honeysett, Lyle Honeysett, Isobella Honeysett, Hilary Honeysett, Annika Honeysett, Teresa Honeysett, Shaun Honeysett, Jessica Honeysett, Maxine Honeysett, Wayne Honeysett, Letisha Honeysett, Shiana Honeysett, Cameron Honeysett, Rhiana Honeysett, Craig Honeysett, Damien James Denny, Tyronne James Bell, Rebecca Jane Denny, Akina Jasmine Button Young, Phillip John Young, Ruth Josephine Bell, Tegan Marree Denny, Karen Rebecca Denny, Wayne Taylor, Nicholas Taylor, Jasmin Taylor, Nicollette Taylor, Lucianna Taylor, Pamela Tighe, Darroll Tighe Jnr, Aaron Tighe, Alex Tighe, Evelyn Tighe, Craig Vincent Honeysett, Pamela Young
Native title rights and interests claimed	The native title rights and interests claimed are the rights to the possession, occupation, use and enjoyment as against the whole world (subject to any native title rights and interests which may be shared with any others who establish that they are native title holders) of the area, and in particular comprise: a) rights to possess, occupy, use and enjoy the area; b) the right to make decisions about the use and enjoyment of the area; c) the right of access to the area; d) the right to control the access of others to the area; e) the right to use and enjoy resources of the area; f) the right to control the use and enjoyment of others of resources of the area; g) the right to trade in resources of the area; i) the right to maintain and protect places of importance under traditional laws, customs and practices in the area; and j) the right to maintain, protect and prevent the misuse of cultural knowledge of the common law holders associated with the area. Subject to: 1. To the extent that any minerals, petroleum or gas within the area of the claim are

	wholly owned by the Crown in the right of the Commonwealth or the state of New South Wales, they are not claimed by the applicants. 2. The claim area does not include any offshore place. 3. The applicants do not make a claim to native title rights and interests which confer possession, occupation, use and enjoyment to the exclusion of all others in respect of any areas in relation to which a previous non-exclusive possession act, as defined in s.23F of the NTA, was done in relation to an area, and, either the act was an act attributable to the Commonwealth, or the act was attributable to the state of New South Wales and a law of that State has made provision as mentioned in s.231 in relation to the act; 4. Paragraph 3 above is subject to such of the provisions of s.47, s47A and s.47B of the Act as apply to any part of the area contained within this application, particulars of which will be provided prior to the hearing. 5. The said native title rights and interests are not claimed to the exclusion of any other rights or interests validly created by or pursuant to the common law, a law of the State or a law of the Commonwealth.
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Area	Jurisdiction: New South Wales Local government region(s): Boorowa Shire Council, Cooma-Monaro Shire Council, Cootamundra Shire Council, Upper Lachlan Council, Goulburn City Council, Gundagai Shire Council, Gunning Shire Council, Harden Shire Council, Mulwaree Shire Council, Queanbeyan City Council, Snowy River Shire Council, Tallaganda Shire Council, Yarrowlumla Shire Council, Yass Shire Council ATSIC region(s): Binaal Billa Regional Council, Queanbeyan Regional Council Representative A/TSI body(s): NSW Native Title Services Ltd Land/water and/or sea: Land/Water Area covered by the claim (as detailed in the application): EXTERNAL BOUNDARY Commencing at Longitude 149.371904 east, Latitude 36.182838 south being a point approximately 3km north west of Umaralla Mountain, the application boundary traverses generally north westerly, crossing the Monard Highway and the Reynolds Barkersdale Creek until Longitude 148.726600 east, Latitude 35.783503 south, being a point approximately 6km to the east of the southern end of the Tantangara Reservoir. Points 1 to 22 reference this section of the boundary as listed on Attachment "B" - Geographic Coordinates. From here the boundary traverses generally northerly through the Kosciusco National Park until Longitude 148.694374 east, Latitude 35.234315 south, then traverses generally north westerly until Longitude 148.543060 east, Latitude 35.090910 south, being a point south of the Bungongo State Forest. The boundary then traverses generally westerly, south of Paddy's Rock Hill, across the Serpentine Ridge and the Tumut River until Longitude 148.161500 east, Latitude 35.039421 south. From this point the boundary traverses generally north westerly until Longitude 148.144685 east, Latitude 35.030631 south being a point approximately located on the Murrumbidgee River. From here the boundary traverses northerly over the Murrumbidgee River again, until Latitude 148.132133 east, Longitude 34.977345 south, being a point approximately on the northern side of the Hume Highway. The boundary then traverses generally north easterly to the east of Nimby until Longitude 148.376766 east, Latitude 34.548290 south, being a point approximately on the eastern side of the town of Harden. Points 23 - 50 reference this section of the boundary as listed on Attachment "B" - Geographic Coordinates. From here the boundary traverses generally east south easterly crossing the Galong Boorowa Railway, then through the Midgee Range until Longitude 149.145529 east, Latitude 34.667445 south. From here the boundary traverses generally north easterly crossing the Lachlan River until Longitude 149.374453 east, Latitude 34.530503 south. From this point the boundary traverses generally south easterly, north of Lake Sooley and across the Oberon Goulbourn Road until Longitude 149.742200 east, Latitude 34.737239 south, being a point approximately on the north eastern outskirts of Goulbourn. From here the boundary traverses generally southerly, approximately 2.75km to the west of Blacks Peak until Longitude 149.806458 east, Latitude 35.505121 south, approximately 7km south of Braidwood. From here the boundary traverses generally south westerly through the Bedland, Tallaganda and Badja State Forests back to the commencement point. Points 51-116 reference this section of the boundary as listed on Attachment "B" - Geographic
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	Coordinates. Geographic coordinates are referenced to Australian Geodetic Datum (AGD) 84, in decimal degrees and area based on the spatial reference data acquired from the various custodians at the time. Use of Coordinates: Where coordinates are used within the description to represent cadastral or topographic boundaries or the intersection with such, they are intended as a guide only. As an outcome to the custodians of cadastral and topographic data continuously recalculation of the geographic position of their data based on improved survey and data maintenance procedures, it is not possible to accurately define such a position other than by detailed ground survey. INTERNAL BOUNDARIES 1. The application excludes the area covered by the Australian Capital Territory. 2. The applicants exclude from the claim any areas covered by valid acts on or before 23 December, 1996, comprising such of the following as are included as extinguishing acts within the Native Title Act 1993, as amended, or the Native Title (New South Wales) Act 1994, as amended, at the time of the Registrar's consideration: i) Category "A" Past Acts, as defined in NTA s.228 and s.229; ii) Category "A" Intermediate Period Acts in NTA s.232A and s.232B. 3. The applicants exclude from the claim any areas in relation to which a previous exclusive possession act, as defined in section 23B of the NTA, was done in relation to an area, and, either the act was an act attributable to the Commonwealth or the state of New South Wales and a law of that State has made provision as mentioned in section 23E in relation to the act. 4. The applicants exclude from the claim areas in relation to which native title rights and interests have otherwise been extinguished, including areas subject to:- a) an act authorised by legislation which demonstrates the exercise of permanent adverse dominion in relation to native title; or b) actual use made by the holder of a tenure other than native title which is permanently inconsistent with the continued existence of native title. To avoid any uncertainty, the applicants exclude from the claim area any of the areas contained within the following descriptions or tenures which have been validly granted, set out in Schedule B1. == SCHEDULE B1 == - B1.1) Any former or current unqualified grant of an estate in fee simple and all other freehold land. - B1.2) A permanent public work and "the land or waters on which a public work is constructed, established or situated" within the meaning given to that phrase by the Native Title Act 1993 (Cth) s.251D. - B1.3) An existing public road or street used by the public, or dedicated road. 5. Paragraphs 2 to 4 above are subject to such of the provisions of sections 47, 47A and 47B of the Act as apply to any part of the area contained within this application, particulars of which will be provided prior to the hearing but which include such areas as may be listed in Schedule L.
Registration information	<i>Please refer to the Register of Native Title Claims/National Native Title Register (as appropriate) for registered details of this application.</i> Date claim entered on Register of Native Title Claims: 04/07/2000 Registration test status: Accepted for registration Registration history: Registered from 04/07/2000.

Attachments	1. Map of Claim Area showing External Boundary, Attachment A of the Application, 1 page - A0, Attached 02/03/2000. 2. Table of Geographical Co-ordinates of the External Boundary, Attachment B of the Application, 4 pages - A4, Attached 02/03/2000. NNTT map attached.
NNTT contact details	Case manager: Nicole Maher Address: National Native Title Tribunal Level 25 25 Bligh Street SYDNEY NSW 2000 GPO Box 9973 SYDNEY NSW 2001 Phone: (02) 9235 6300 Freecall 1800 640 501 Fax: (02) 9233 5613 Web page: www.nntt.gov.au



NATIONAL NATIVE TITLE TRIBUNAL

Application Information and Extract from the Register of Native Title Claims

Application Information

Application numbers:	Federal Court number:	N6001/2000
	NNTT number:	NC00/1
Application name:	Donald Thomas Bell on Behalf of the Ngunawal People (Ngunawal People (NSW))	
Registration history:	Registered from 04/07/2000.	

Register Extract (pursuant to s.186 of the *Native Title Act 1993*)

Application filed with:	Federal Court of Australia
Date application filed:	02/03/2000
Date claim entered on Register:	04/07/2000
Applicants:	Mr Donald Thomas Bell
Address for service:	Dean Bell 11 Berger Street SOUTH WINDSOR NSW 2756

Area covered by the claim:

EXTERNAL BOUNDARY

Commencing at Longitude 149.371904 east, Latitude 36.182838 south being a point approximately 3km north west of Umaralla Mountain, the application boundary traverses generally north westerly, crossing the Monard Highway and the Reynolds Barkersdale Creek until Longitude 148.726600 east, Latitude 35.783503 south, being a point approximately 6km to the east of the southern end of the Tantangara Reservoir. Points 1 to 22 reference this section of the boundary as listed on Attachment "B" - Geographic Coordinates.

From here the boundary traverses generally northerly through the Kosciusco National Park until Longitude 148.694374 east, Latitude 35.234315 south, then traverses generally north westerly until Longitude 148.543060 east, Latitude 35.090910 south, being a point south of the Bungongo State Forest. The boundary then traverses generally westerly, south of Paddy's Rock Hill, across the Serpentine Ridge and the Tumut River until Longitude 148.161500 east, Latitude 35.039421 south. From this point the boundary traverses generally north westerly until Longitude 148.144685 east, Latitude 35.030631 south being a point approximately located on the Murrumbidgee River. From here the boundary traverses northerly over the Murrumbidgee River again, until Latitude 148.132133 east, Longitude 34.977345 south, being a point approximately on the northern side of the Hume Highway. The boundary then traverses generally north easterly to the east of Nimby until Longitude 148.376766 east, Latitude 34.548290 south, being a point approximately on the eastern side of the town of Harden. Points 23 - 50 reference this section of the boundary as listed on Attachment "B" - Geographic Coordinates.

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Geographic coordinates are referenced to Australian Geodetic Datum (AGD) 84, in decimal degrees and area based on the spatial reference data acquired from the various custodians at the time.

Use of Coordinates: Where coordinates are used within the description to represent cadastral or topographic boundaries or the intersection with such, they are intended as a guide only. As an outcome to the custodians of cadastral and topographic data continuously recalculation of the geographic position of their data based on improved survey and data maintenance procedures, it is not possible to accurately define such a position other than by detailed ground survey.

INTERNAL BOUNDARIES

1. The application excludes the area covered by the Australian Capital Territory.
2. The applicants exclude from the claim any areas covered by valid acts on or before 23 December, 1996, comprising such of the following as are included as extinguishing acts within the Native Title Act 1993, as amended, or the Native Title (New South Wales) Act 1994, as amended, at the time of the Registrar's consideration:

- i) Category "A" Past Acts, as defined in NTA s.228 and s.229;
- ii) Category "A" Intermediate Period Acts in NTA s.232A and s.232B.

3. The applicants exclude from the claim any areas in relation to which a previous exclusive possession act, as defined in section 23B of the NTA, was done in relation to an area, and, either the act was an act attributable to the Commonwealth or the state of New South Wales and a law of that State has made provision as mentioned in section 23E in relation to the act.

4. The applicants exclude from the claim areas in relation to which native title rights and interests have otherwise been extinguished, including areas subject to:-

- a) an act authorised by legislation which demonstrates the exercise of permanent adverse dominion in relation to native title; or
- b) actual use made by the holder of a tenure other than native title which is permanently inconsistent with the continued existence of native title.

To avoid any uncertainty, the applicants exclude from the claim area any of the areas contained within the following descriptions or tenures which have been validly granted, set out in Schedule B1.

== SCHEDULE B1 ==

- B1.1) Any former or current unqualified grant of an estate in fee simple and all other freehold land.
- B1.2) A permanent public work and "the land or waters on which a public work is constructed, established or situated" within the meaning given to that phrase by the Native Title Act 1993 (Cth) s.251D.
- B1.3) An existing public road or street used by the public, or dedicated road.

5. Paragraphs 2 to 4 above are subject to such of the provisions of sections 47, 47A and 47B of the Act as apply to any part of the area contained within this application, particulars of which will be provided prior to the hearing but which include such areas as may be listed in Schedule L.

Persons claiming to hold native title:

The claim is brought on behalf of the people listed below and their children; Donald Thomas Bell, Erin Bell, Dean Bell, Merekai Bell, Danicka Bell, Tiara Biggs, Raymond Brydon, Caitlin Brydon, Darrell Brydon, Robert Brydon, Emily Brydon, Leesa Brydon, Jacob Brydon, Jordanne Brydon, Jeremy Brydon, Joshua Brydon, Samantha Brydon, Dawn Brydon, Deborah Brydon, Gavin Brydon, Angela Brydon, Brett Brydon, Andrew Brydon, Amanda Brydon, Malcolm Brydon, Dorothy Carroll, Darroll Charles Tighe, Phyllis Gertrude Carroll, Nicole Hall, Mitchell Hall, Barry Honeysett, Pamela Honeysett, Kaziah Honeysett, Curtis Honeysett, Darryl Honeysett, Lucille Honeysett, Dean Honeysett, Donna Honeysett, Dwayne Honeysett, James Honeysett, Angela Honeysett, Gordon Honeysett, Colleen Honeysett, Lyle Honeysett, Isobella Honeysett, Hilary Honeysett, Annika Honeysett, Teresa Honeysett, Shaun Honeysett, Jessica Honeysett, Maxine Honeysett, Wayne Honeysett, Letisha Honeysett, Shiana Honeysett, Cameron Honeysett, Rhiana Honeysett, Craig Honeysett, Damien James Denny, Tyronne James Bell, Rebecca Jane Denny, Akina Jasmine Button Young, Phillip John Young, Ruth Josephine Bell, Tegan Marree Denny, Karen Rebecca Denny, Wayne Taylor, Nicholas Taylor, Jasmin Taylor, Nicollette Taylor, Lucianna Taylor, Pamela Tighe, Darroll Tighe Jnr, Aaron Tighe, Alex Tighe, Evelyn Tighe, Craig Vincent Honeysett, Pamela Young

Registered native title rights and interests:

The following Native Title Rights & Interests were entered on the Register on 04/07/2000:

The native title rights and interests claimed are the rights to the possession, occupation, use and enjoyment as against the whole world (subject to any native title rights and interests which may be shared with any others who establish that they are native title holders) of the area, and in particular comprise:

- a) rights to possess, occupy, use and enjoy the area;
- b) the right to make decisions about the use and enjoyment of the area;
- c) the right of access to the area;
- d) the right to control the access of others to the area;
- e) the right to use and enjoy resources of the area;
- f) the right to control the use and enjoyment of others of resources of the area;
- g) the right to trade in resources of the area;

- i) the right to maintain and protect places of importance under traditional laws, customs and practices in the area; and
- j) the right to maintain, protect and prevent the misuse of cultural knowledge of the common law holders associated with the area.

Subject to:

1. To the extent that any minerals, petroleum or gas within the area of the claim are wholly owned by the Crown in the right of the Commonwealth or the state of New South Wales, they are not claimed by the applicants.
2. The claim area does not include any offshore place.
3. The applicants do not make a claim to native title rights and interests which confer possession, occupation, use and enjoyment to the exclusion of all others in respect of any areas in relation to which a previous non-exclusive possession act, as defined in s.23F of the NTA, was done in relation to an area, and, either the act was an act attributable to the Commonwealth, or the act was attributable to the state of New South Wales and a law of that State has made provision as mentioned in s.231 in relation to the act;
4. Paragraph 3 above is subject to such of the provisions of s.47, s47A and s.47B of the Act as apply to any part of the area contained within this application, particulars of which will be provided prior to the hearing.
5. The said native title rights and interests are not claimed to the exclusion of any other rights or interests validly created by or pursuant to the common law, a law of the State or a law of the Commonwealth.

Register attachments:

1. Table of Geographical Co-ordinates of the External Boundary, Attachment B of the Application, 4 pages - A4, Attached 02/03/2000.

There is an AO size map of the application area which is too large to be included. This map can be viewed at the Sydney Registry of the National Native Title Tribunal.

Note: The Register may, in accordance with s.188 of the Native Title Act 1993, contain confidential information that will not appear on the Extract.

NATIVE TITLE CLAIMANT APPLICATION: NC00/001 (Ngunawal (N' SW)) N6001/2000



Area of Application (geographic extent)
= 14,437 sq km

NOTE 1

To determine areas subject to claim, and rights and interests sought within the external boundary, reference to the application description is necessary.

NOTE 2

This map does not form part of the Register of Native Title Claims.

It is provided as general information only and to assist in locating the area involved.

The Registrar, the National Native Title Tribunal and its staff and officers and the Commonwealth, accept no liability for, and give no undertakings, guarantees or warranties concerning the accuracy, completeness or fitness for purpose of the map.

Map created by:

Geospatial Analysis & Mapping Branch,
National Native Title Tribunal (08/08/2000)

Application boundary data compiled by NNTT and referenced to spatial data sourced from AUSLIG.

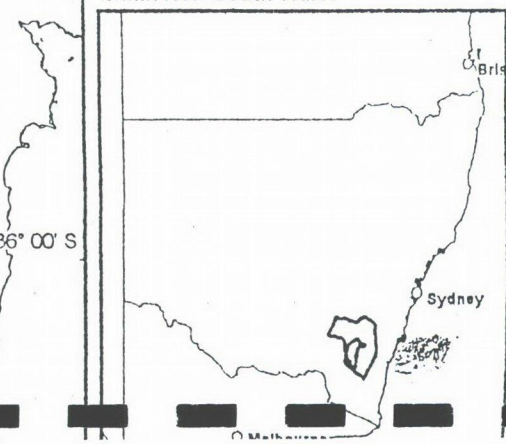


0 50
KILOMETRES

Latitude and Longitude based on Australian Geodetic Datum 1984

P:\Geo_info\projects\assistance to case managers
nsw\nc00_001\nc00_001_A41.wor

Location of NC00/001 within New South Wales





What is the weather usually like?

- Climate Averages for Australian Sites -

Averages for GOULBURN

Make sure you understand what the [Climate Averages are all about](#) before you make use of the following information. A comma separated text file of these averages is also available for [download](#) which can be graphed in software such as a spreadsheet

070037	GOULBURN					Commenced: 1857					Last record: 1967				
Latitude:-34.7500 S			Longitude: 149.8667 E			Elevation: 702.0 m			State: NSW						
JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN	No. Yrs	%age comp	
Mean Daily Max Temp (deg C)															
28.1	27.0	24.8	20.3	15.7	12.1	11.4	13.4	17.0	20.8	23.9	26.8	20.1	97.9	90	
Mean no. Days, Max >= 40.0 deg C															
0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	97	
Mean no. Days, Max >= 35.0 deg C															
1.8	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	0.8	4.3	5.3	97	
Mean no. Days, Max >= 30.0 deg C															
9.2	8.4	4.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	3.8	5.4	31.5	5.3	97	
Highest Max Temp (deg C)															
37.8	36.7	35.6	30.6	25.7	19.4	17.8	22.8	29.4	28.9	35.6	38.3	38.3	5.3	98	
Mean Daily Min Temp (deg C)															
13.2	13.0	11.3	7.4	4.2	2.5	1.3	2.0	4.3	6.9	9.4	11.7	7.3	97.9	90	
Mean no. Days, Min <= 2.0 deg C															
0.0	0.0	0.3	2.5	9.3	13.6	18.4	16.6	5.0	2.6	0.4	0.0	68.8	5.3	97	
Mean no. Days, Min <= 0.0 deg C															

0.0	0.0	0.0	0.3	3.8	8.8	10.6	7.6	1.6	0.0	0.0	0.0	32.8	5.3	97
Lowest Min Temp (deg C)														
5.2	4.4	0.2	-0.6	-2.8	-7.8	-6.7	-4.4	-2.8	0.2	1.7	3.3	-7.8	5.3	95
Mean 9am Air Temp (deg C)														
20.4	19.7	17.3	13.2	9.0	6.1	5.4	7.2	11.2	14.9	17.9	20.1	13.5	55.2	91
Mean 9am Wet-bulb Temp (deg C)														
15.7	15.7	14.1	10.7	7.4	4.9	4.1	5.3	8.3	11.1	13.1	15.0	10.4	55.0	91
Mean 9am Dew Point Temp (deg C)														
11.1	11.3	10.7	8.1	5.7	3.2	2.2	3.0	5.5	7.5	8.8	10.8	7.3	5.0	94
Mean 9am Relative Humidity (%)														
59	64	69	73	79	82	80	75	66	60	56	56	68	55.0	91
Mean 9am Wind Speed (km/hr)														
9.7	9.1	9.1	8.1	7.2	8.2	11.0	12.5	13.5	10.2	11.7	8.9	9.9	5.2	95
Mean 3pm Air Temp (deg C)														
26.0	25.5	23.1	18.5	14.2	10.8	10.1	12.1	15.6	18.9	22.1	24.6	18.5	53.2	91
Mean 3pm Wet-bulb Temp (deg C)														
17.7	17.9	16.4	13.4	10.5	8.1	7.3	8.3	10.6	12.8	14.8	16.8	12.9	53.0	91
Mean 3pm Dew Point Temp (deg C)														
9.8	9.3	8.8	6.8	6.0	5.1	3.3	3.9	4.9	6.9	7.4	10.4	6.8	5.0	94
Mean 3pm Relative Humidity (%)														
42	45	48	54	60	68	64	57	50	47	42	43	52	53.0	91
Mean 3pm Wind Speed (km/hr)														
12.9	14.4	13.7	13.3	12.4	15.1	17.1	18.4	19.2	13.4	16.1	14.8	15.0	5.1	94
Mean Rainfall (mm)														
64.8	60.6	55.6	48.5	51.5	56.3	47.8	49.1	50.0	62.5	56.1	62.9	665.7	103.4	94
Median (Decile 5) Rainfall (mm)														
61.4	46.4	41.7	40.3	31.0	44.2	35.3	42.5	43.3	57.8	45.2	48.7	625.8	102	
Decile 9 Rainfall (mm)														
120.4	138.2	124.5	106.2	129.1	115.5	95.3	90.6	92.1	110.2	109.8	141.6	922.3	102	
Decile 1 Rainfall (mm)														
11.1	3.3	6.4	5.9	8.5	15.7	18.5	14.7	16.6	20.0	12.3	14.9	459.3	102	
Mean no. of Raindays														
7.5	7.2	7.4	7.7	9.0	11.0	10.9	10.2	9.5	9.2	7.9	7.9	105.3	103.0	94
Highest Monthly Rainfall (mm)														
254.7	224.0	251.2	163.3	299.5	318.2	243.4	169.5	175.4	236.8	221.0	217.4		103.4	94
Lowest Monthly Rainfall (mm)														
0.6	0.3	0.0	1.3	2.1	5.1	5.8	2.6	4.8	5.3	0.3	1.8		103.4	94

Highest Recorded Daily Rain (mm)

121.4	95.3	105.7	94.7	122.7	68.8	136.1	52.1	64.8	125.7	93.2	122.2	136.1	103.3	94
-------	------	-------	------	-------	------	-------	------	------	-------	------	-------	-------	-------	----

Mean no. of Clear Days

7.0	6.3	7.7	8.0	6.3	6.2	6.0	4.8	6.6	5.8	7.4	6.8	78.9	5.3	98
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	------	-----	----

Mean no. of Cloudy Days

12.0	8.3	12.0	11.0	13.3	14.4	13.6	16.8	12.2	14.2	10.4	15.2	153.5	5.3	98
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Last modified 7 October 2003

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Noxious weeds



Noxious Weeds in NSW

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NSW Agriculture

Mulwaree

The following weeds are declared noxious in the Mulwaree control area. The 'details' link on each listing provides further information on the legal requirements of the weed's listing and any variation in status within the local control area. [A complete list of all weeds in all control areas is also available as a PDF document.](#)

Common name	Scientific name	Category	
African boxthorn	<i>Lycium ferocissimum</i>	W2	details
African love grass	<i>Eragrostis curvula</i>	W3	details
Alligator weed	<i>Alternanthera philoxeroides</i>	W1	details
Bathurst	<i>Xanthium spp.</i>	W2	details
Noogoora			
Californian			
Cockle burrs			
Black knapweed	<i>Centaurea nigra</i>	W1	details
Blackberry	<i>Rubus fruticosus (agg. spp.)</i>	W3	details
Broomrape	<i>Orobanche spp.</i>	W1	details
Cabomba	<i>Cabomba spp.</i>	W4g	details
Dodder	<i>Cuscuta campestris</i>	W2	details
Fireweed	<i>Senecio madagascariensis</i>	W2	details
Gorse	<i>Ulex europaeus</i>	W2	details
Green cestrum	<i>Cestrum parqui</i>	W2	details
Harrisia cactus	<i>Harrisia spp.</i>	W4f	details
Hawkweed	<i>Hieracium spp.</i>	W1	details
Horsetail	<i>Equisetum spp.</i>	W1	details
Karoo thorn	<i>Acacia karroo</i>	W1	details
Kochia	<i>Kochia scoparia</i>	W1	details
Lagarosiphon	<i>Lagarosiphon major</i>	W1	details
Mexican feather grass	<i>Nassella tenuissima syn Stipa tenuissima</i>	W1	details
Miconia	<i>Miconia spp.</i>	W1	details
Nodding thistle	<i>Carduus nutans</i>	W2	details
Pampas grass	<i>Cortaderia spp.</i>	W2	details
Parthenium weed	<i>Parthenium hysterophorus</i>	W1	details
Paterson's curse, Vipers	<i>Echium spp.</i>	W3	details

Italian bugloss			
Prickly pears	<i>Opuntia spp.</i>	W4f	details
Rhus tree	<i>Toxicodendron succedaneum</i>	W2	details
Salvinia	<i>Salvinia molesta</i>	W1	details
Scotch	<i>Cytisus scoparius</i>	W2	details
English broom			
Scotch	<i>Onopordum spp.</i>	W3	details
Illyrian			
Stemless thistles			
Senegal tea plant	<i>Gymnocoronis spilanthoides</i>	W1	details
Serrated tussock	<i>Nassella trichotoma</i>	W2	details
Siam weed	<i>Chromolaena odorata</i>	W1	details
Sifton bush	<i>Cassinia arcuata</i>	W3	details
Spotted	<i>Centaurea maculosa</i>	W1	details
knapweed			
St John's wort	<i>Hypericum perforatum</i>	W2	details
Sweet briar	<i>Rosa rubiginosa</i>	W3	details
Water hyacinth	<i>Eichhornia crassipes</i>	W1	details
Water lettuce	<i>Pistia stratiotes</i>	W1	details
Wild radish	<i>Raphanus raphanistrum</i>	W2	details
Willows	<i>Salix spp.</i>	W4g	details

For further information about weeds or weed control, visit the [NSW Agriculture Weeds page](#) or send an e-mail message to weeds@agric.nsw.gov.au.

The information contained in this web page is based on knowledge and understanding of Order(s) under the Noxious Weeds Act 1993 at the time of writing or at the time of last review . However, because:

- there may be changes to the Order(s) users are reminded of the need to ensure that information on which they rely is up to date, and
- some weed declarations of particular weeds have explanatory or qualifying notes and users should check the accuracy, completeness and currency of information by:
 - reading the Order(s),
 - inquiring with the appropriate officer of the Local Government Authority for the user's locality, and/or
 - consulting with an independant advisor.

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Working

Management of contaminated land

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did not find any records in our database.

If a site does not appear on the record it may still be affected by contamination. For example:

- Contamination may be present but the site has not been regulated by the EPA under the Contaminated Land Management Act 1997 or the Environmentally Hazardous Chemicals Act 1985.
- The EPA may be regulating contamination at the site through a licence or notice under the Protection of the Environment Operations Act 1997 (POEO Act).
- Contamination at the site may be being managed under the [planning process](#).

Search TIP

To search for a specific site, search by LGA (local government area) and carefully review all sites listed.

[... more search tips](#)

More information about particular sites may be available from:

- The [POEO public register](#)
- The appropriate planning authority: for example, on a planning certificate issued by the local council under [section 149 of the Environmental Planning and Assessment Act](#).

See [What's in the record](#) and [What's not in the record](#).



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11 November 2004



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Emission Report

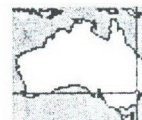
You are here: [NPI Home](#) > [NPI Database](#)

17 November 2004
11:55

Substance Emission Details - Reporting Facilities: Mulwaree (A), NSW

Industrial facilities are required to report emissions to the NPI if they use more than a certain amount of one or more substances on the NPI reporting list, or consume more than a specified amount of fuel or electric power, or emit more than a certain amount of nitrogen or phosphorus to water. Emissions are estimated using techniques outlined in industry handbooks and related manuals - see further details on industry reporting. Note that toxicity of listed substances varies, and a small amount of a highly toxic substance may be of more concern than a larger emission of a less toxic substance.

Reporting Year: 2002 - 2003

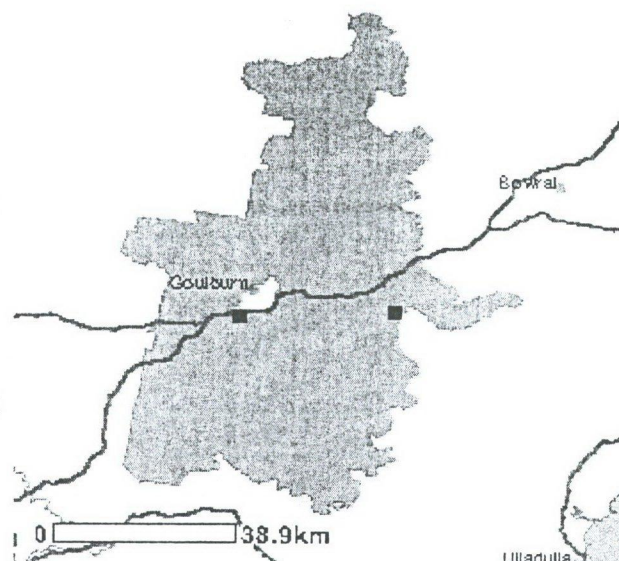


This report includes:

- Emissions from facilities in **Mulwaree (A), NSW**.
- Top substances emitted by each facility.
- Ranking for each substance emission - 1=lowest; 100=highest.

Explanation of rankings: Individual substance emissions from each facility are compared against the maximum emission of that substance from all of the facilities reported on the NPI, on a scale of 1-100 (from lowest to highest) - if the total emission of a substance is 10% of the maximum reported to the NPI, the emission ranking would be **10**; if the total emission is 95% of the maximum, the ranking would be **95**. A score of 100 means that the facility is the highest facility emitter of that substance - in some cases many facilities may score 100, due to rounding. Top substances are those substance emissions that are ranked highest for any individual facility.

For example, a small rural sewage treatment plant may report a very small Total nitrogen emission in comparison with a large metropolitan facility. If the rural facility reported an emission that is 7% of the maximum Total Nitrogen emission in Australia it would attract a ranking of 7. This ranking tells you that there are many other facilities that have much larger emissions of Total Nitrogen. On the other hand a metropolitan sewage treatment plant may have a very large Total Nitrogen emission and therefore attracts a ranking of 100 for this substance. This only means that this particular



Map of Mulwaree (A), NSW:
Selected NPI facilities are shown as ■

facility has approximately the largest individual emission of that substance in Australia.

Facilities (alphabetic order)	Top Substance Emissions and Rankings				
	Rankings are shown as: ○=0-25; ●=26-50; ●=51-75; ●=76-100. [actual rankings are shown in brackets: 1=lowest; 100=highest]				
Blue Circle Southern Cement Ltd (Marulan Cement Works, Marulan South NSW)	Magnesium oxide fume	Formaldehyde (methyl aldehyde)	Oxides of Nitrogen	Nickel carbonyl	Particulate Matter 10.0 um
	○ [Low - 6]	○ [Low - 3]	○ [Low - 2]	○ [Low - 1]	○ [Low - 1]
Southern Meats Pty Ltd (Southern Meats Goulburn Abattoir, Goulburn NSW)	Ammonia (total)	Oxides of Nitrogen	Mercury & compounds	Particulate Matter 10.0 um	Carbon monoxide
	○ [Low - 1]	○ [Low - 1]	○ [Low - 1]	○ [Low - 1]	○ [Low - 1]

The disclaimer has further information about the use of NPI data.

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Emission Report

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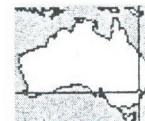
11 November 2004
11:35

Substance Emissions - All Sources : Mulwaree (A), NSW

The NPI holds data reported by larger industrial facilities, and aggregated emission data for smaller facilities and mobile and non-industrial sources, collected by participating jurisdictions. Accuracy of data varies along with estimation techniques - see explanation of data below. The listed substances span a wide range of toxicities, and a small amount of a highly toxic substance may be of more concern than a larger emission of a less toxic substance. This report includes data for industrial facilities and aggregated emission data (if available for this area).

Reporting Year: 2002 - 2003 (for facilities only)

Data Source: All sources - Reporting Facilities + Aggregated Emission Data
([click](#) to exclude Aggregated Emission Data)



This report includes:

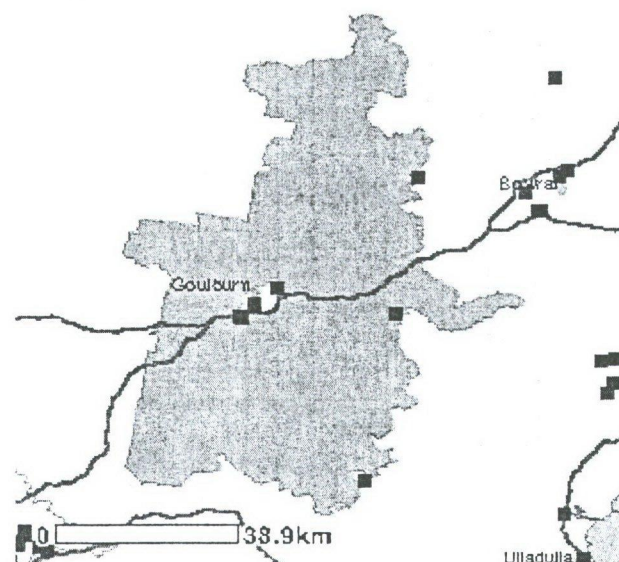
- Summary of emission sources for this area - **Mulwaree (A), NSW**.
- Top sources for each substance, and amounts emitted.
- [Explanation](#) of data and calculations.

See also other reports on:

- Facility emission details for this area (new window).

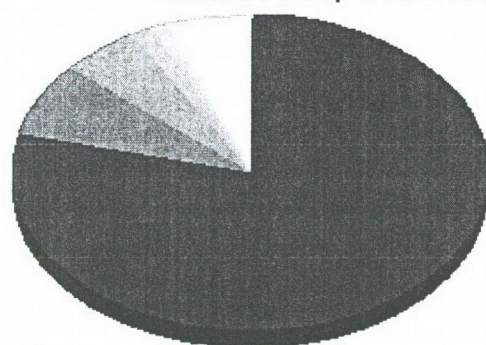
Source Summary - Mulwaree (A), NSW

- 28 substances from 30 sources were found.
- 2 facilities reported to the NPI.
- Additional aggregated emission data was collected for 28 sources.
- Indicative top sources for this region are shown in the pie chart. Note that only substances listed on [Table 1](#) were used in the calculation - these substances were required to be reported for the first three reporting years.



Map of Mulwaree (A), NSW:
NPI facilities are shown as ■

Indicative Top Sources (Table 1 Substances Only)



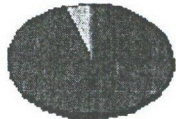
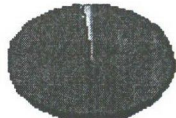
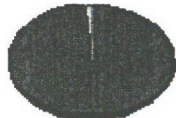
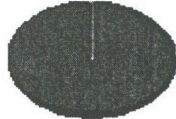
- Meat and Meat Product Manufacturing [211]
- Unfertilised grazing-Hawkesbury-Nepean River
- Bushland-Hawkesbury-Nepean River
- Conservation/Bushland-Shoalhaven River
- All Others

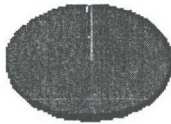
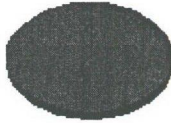
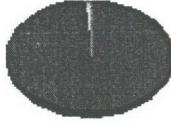
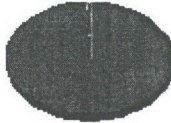
The indicative top sources, a broad snapshot of all emissions reported in this area, are derived by converting each emission into proportional units, and then pooling those proportional units. This calculation does not account for any variation in toxicity or ground level concentration of these substances - see further explanation below. For more accurate information, refer to individual substance information in the table below under Top Sources By Substance.

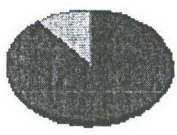
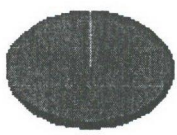
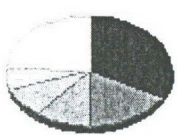
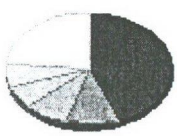
Top Sources by Substance - Mulwaree (A), NSW

The table shows emissions of all substances in this area, and the top sources for each substance. All emission amounts have been rounded to two significant figures. Note that totals may differ from the sum of the individual amounts because of this rounding. Source names for reporting facilities are shown as ANZSIC Groups; source names for any aggregated emission data are marked with *. See explanation for information on NPI data, or click on the source name.

Substance (sort by total emission)	Total Emissions (kg)	Emission Sources		
		Distribution (pie chart)	Name (Aggregated Data Source * or ANZSIC Group)	Sub-total (kg)
Ammonia (total)	36,000		Meat and Meat Product Manufacturing [211]	36,000
Arsenic & compounds (Table 1)	2		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	2
			Meat and Meat Product Manufacturing [211]	0.011
Benzene (Table 1)	2,300		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	2,300
Beryllium & compounds	1.7		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	1.7
			Meat and Meat Product Manufacturing [211]	0.00060
			Cement, Lime, Plaster and	

Cadmium & compounds (Table 1)	1.3		Concrete Product Manufacturing [263]	1.2
			Meat and Meat Product Manufacturing [211]	0.061
Carbon monoxide (Table 1)	280,000		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	280,000
			Meat and Meat Product Manufacturing [211]	4,500
Chromium (III) compounds	4.8		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	4.7
			Meat and Meat Product Manufacturing [211]	0.052
Chromium (VI) compounds (Table 1)	0.82		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	0.80
			Meat and Meat Product Manufacturing [211]	0.022
Cobalt & compounds (Table 1)	0.0044		Meat and Meat Product Manufacturing [211]	0.0044
Copper & compounds	28		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	28
			Meat and Meat Product Manufacturing [211]	0.047
Fluoride compounds (Table 1)	430		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	430
Formaldehyde (methyl aldehyde)	7,300		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	7,300
Hydrochloric acid	430		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	430

Lead & compounds (Table 1)	5.6		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	5.6
			Meat and Meat Product Manufacturing [211]	0.027
Magnesium oxide fume	160		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	160
Manganese & compounds	0.021		Meat and Meat Product Manufacturing [211]	0.021
Mercury & compounds (Table 1)	1.7		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	1.7
			Meat and Meat Product Manufacturing [211]	0.018
Nickel & compounds	14		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	14
			Meat and Meat Product Manufacturing [211]	0.11
Nickel carbonyl (Table 1)	2		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	2
Oxides of Nitrogen (Table 1)	750,000		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	750,000
			Meat and Meat Product Manufacturing [211]	5,400
Particulate Matter 10.0 um (Table 1)	83,000		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	82,000
			Meat and Meat Product Manufacturing [211]	410
Polychlorinated dioxins and furans	0.000047		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	0.000047

Polycyclic aromatic hydrocarbons (Table 1)	0.34		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	0.30
			Meat and Meat Product Manufacturing [211]	0.037
Sulfur dioxide (Table 1)	45,000		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	44,000
			Meat and Meat Product Manufacturing [211]	13
Total Nitrogen (Table 1)	730,000		Unfertilised grazing-Hawkesbury-Nepean River *	260,000
			Bushland-Hawkesbury-Nepean River *	130,000
			Conservation/Bushland-Shoalhaven River *	84,000
			Grazing/Pasture Unimproved-Shoalhaven River *	64,000
			Cropping-Murray-Darling Basin *	50,000
Total Phosphorus (Table 1)	83,000		Unfertilised grazing-Hawkesbury-Nepean River *	39,000
			Bushland-Hawkesbury-Nepean River *	8,700
			Grazing/Pasture Unimproved-Shoalhaven River *	7,300
			Cropping-Murray-Darling Basin *	6,200
			Conservation/Bushland-Shoalhaven River *	5,900
Total Volatile Organic Compounds	59,000		Cement, Lime, Plaster and Concrete Product Manufacturing [263]	58,000
			Meat and Meat Product Manufacturing [211]	300
Zinc and compounds	1.6		Meat and Meat Product Manufacturing [211]	1.6

Explanation of Data and Calculations

The NPI reports on emissions of chemical substances and where and from what sources they are generated. The ultimate fate of these substances and therefore exposure to humans and the environment as pollution cannot be determined from the NPI. Numerous factors such as height of emission (high stacks versus ground level vehicle exhausts), nature of receiving environment,

chemical reactivity of the substance and prevailing meteorological conditions determine whether an emission is felt as ground level pollution. Since NPI does not attempt to collect these parameters, the data can only reflect pollutant generation at source.

The NPI holds emission data reported by industrial facilities, and aggregated emission data collected by participating jurisdictions. Industrial facilities are required to report emissions to the NPI if they use more than a certain amount of one or more substances on the NPI reporting list, or consume more than a specified amount of fuel or electric power, or emit more than a certain amount of nitrogen or phosphorus to water. Aggregated data include smaller facilities that are not required to report, and mobile and non-industrial sources such as transport, domestic activities and for water catchments and land use type (see further details on NPI data).

The techniques used to estimate emissions in the NPI have been variously approved by Commonwealth, State and Territory environment agencies but it is important to note that the accuracy of these estimates is likely to vary according to the technique used. For the aggregated emissions data in particular, comparative analysis of the data may be misleading, because jurisdictions may have used different approved estimation techniques. Industrial facilities estimate emissions using a technique described in an appropriate NPI handbook, or else otherwise approved.

The listed substances span a wide range of toxicities. A small number may not necessarily imply an insignificant emission; for example, a small emission of a highly toxic substance may be of more concern than a larger emission of a substance of relatively lower toxicity. All emission amounts reported here have been rounded to two significant figures - totals may differ from the sum of the individual amounts on these reports because of this rounding. Some minor discrepancies may also occur with catchment and airshed data, particularly when queried at a fine spatial resolution such as a postcode. This is because these data are collected at varying spatial resolutions.

Indicative top sources are derived by converting each emission into proportional units - this provides an equal weighting for each substance, and does not consider any variation in hazard or possibility of exposure to substances. The following worked example illustrates the calculation of equivalent percentage units in a queried area: If the total emission of Chromium (VI) compounds is 4.4kg, and motor vehicles emit 3.7kg, the proportional units for motor vehicles for Chromium (VI) compounds are calculated as $(3.7/4.4) \times 100 = 80.8$. Similarly, if the total reported emission for Benzene is 30,000kg, and motor vehicles emit 28,000kg, the proportional units for motor vehicles for Benzene $(28,000/30,000) \times 100 = 94.1$. This calculation is repeated for each substance/source combination, and the proportional units for a source are then summed to provide a total contribution of that source to the emission profile for this area.

Substance	Total Emissions	Motor Vehicles		Repeat for all sources
		Emission	Proportional Emission Units [(Emission/Total)*100]	...
Benzene	30,000kg	28,000kg	$(28,000/30,000) \times 100 = 94.1$	...
Chromium (VI) compounds	4.4kg	3.7kg	$(3.7/4.4) \times 100 = 80.8$	...
Repeat for all substances	...	...	...	...
Total proportional units			Sum for each source	

The [disclaimer](#) has further information about the use of NPI data.

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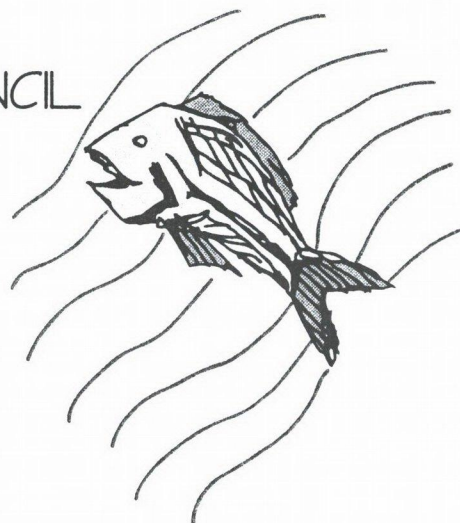
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Department of the Environment and Heritage
GPO Box 787 Canberra ACT 2601 Australia
Telephone: (02) 6274 1111

Appendix F Pejar Local Aboriginal Land Council Report

PEJAR LOCAL ABORIGINAL LAND COUNCIL

PO Box 289 Goulburn NSW 2580
Phone (02) 4822 3552 • Fax (02) 4822 3551
email address: pejar@goulburn.net.au
ABN: 72 662 632 151



RECORD OF SITE INSPECTION AND/OR ASSESSMENT

Aboriginal Protocol Policy

Pejar LALC Representative: Justin Boney

Owner/Developer/Council or other Representative: Nigel Robinson - RTA

Date	14 December 2004	Comments
DA Number		
Lot Number		
DP Number		
REF Number		
Other	Tyces Ln between Hume Highway North and South Bound Lanes	

Has a Site Assessment been carried out by Pejar LALC?

☒ Yes

☐ No

Aboriginal Heritage Identified during Pejar LALC inspection

☐ Yes

☒ No

didn't inspect

Comments: An Archaeological assessment is not required on this part of Road, as it has major disturbance due to Grader refills and scrapings.

Archaeological Assessment Required: Yes

☒ No

Existing Archaeological Report:

☐ Yes

☒ No

Unsure

Aboriginal Protocol Condition to be applied to DA: Yes

No

Condition:

That a Pejar LALC representative is on site before and during any work, at least 7 days notice in writing will be required and a fee will be charged to the developer/owner or their representative of \$100 per hour plus GST.

Authorised Pejar LALC Representative Signature:

Delise Freeman