PROPOSED PACIFIC HIGHWAY UPGRADE – BUNDACREE CREEK TO POSSUM BRUSH

Director-General's Report
Section 115C of the
Environmental Planning and Assessment Act 1979

August 2003

Published August 2003
NSW Department of Infrastructure, Planning
and Natural Resources
www.planning.nsw.gov.au
03/101
ISBN 0 7347 0432 1

FOREWORD

The Roads and Traffic Authority of NSW (RTA) proposes to upgrade the Pacific Highway by constructing approximately 10 kilometres of dual carriageway to the north and south of Nabiac, about 140 kilometres north of Newcastle. The proposal runs from Bundacree Creek south of Nabiac to Possum Brush north of Nabiac. It was developed to address road safety and travel time concerns and forms part of the Pacific Highway Upgrade Program being jointly funded by the State and Commonwealth governments. The main objectives of the Upgrade Program, to improve the Highway's safety and efficiency, are relevant for this project.

This report was prepared in accordance with Section 115C of the EP&A Act, which requires that the Minister obtain a report from the Director-General prior to making a decision. The report's purpose is to review the proposal's environmental impact statement (EIS), issues raised in representations to the EIS's public exhibition, further information provided by the Proponent and any other information identified by the Department concerning the proposal's potential environmental impacts.

The report documents this independent assessment of the proposal. It concludes that the:

- proposal satisfies its objectives and is the best alternative of those considered; and
- proposal's potential environmental impacts can be mitigated to an acceptable level by adopting management measures identified in this report and reflected in the Recommended Conditions of Approval.

The proposal is recommended for approval subject to the recommended conditions.

Jennifer Westacott
Director-General
Department of Infrastructure, Planning and Natural Resources

TABLE OF CONTENTS

LIST OF FIGURES

APPENDICES

GLOSSARY AND ABBREVIATIONS

AADT	Annual Average Daily Traffic
Acid Sulfate Soils (ASS)	Naturally acid clays, mud and other sediments usually found in swamps and estuaries. These may become extremely acidic when drained and exposed to oxygen, and may produce acidic leachate and runoff which can pollute receiving waters and liberate toxins
Ambient Noise	The background noise at a point being a composite of sounds from near and far
ANZECC	Australian and New Zealand Environment and Conservation Council
Department, the	Department of Infrastructure, Planning and Natural Resources
Director-General	Director-General of the Department of Infrastructure, Planning and Natural Resources
DIPNR	Department of Infrastructure, Planning and Natural Resources
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EPA	Environment Protection Authority (NSW)
EP&A Act	*Environmental Planning and Assessment Act 1979*
Floodplain	Flat large area of alluvium adjacent to a watercourse, characterised by frequent active erosion and aggregation by channelled and overbank stream flow
Grade separation	The separation of a road, rail or other traffic so that crossing of movements, which would otherwise conflict, are at different elevations
Interchange	A grade separation of two or more roads with one or more interconnecting carriageways
Level of Services (LOS)	An indicator of performance of the road network
Median	A strip of road not normally intended for use by traffic, which separates carriageways for traffic in opposite directions
Minister	Minister for Infrastructure and Planning
NPWS	National Parks and Wildlife Service
Proponent	Roads and Traffic Authority
RTA	Roads and Traffic Authority
SEPP 14	State Environmental Planning Policy No. 14 - Coastal Wetlands
TSC Act	Threatened Species Conservation Act 1995
Wetland	Land either permanently or temporarily covered by water, usually characterised by vegetation of moist-soil or aquatic type

EXECUTIVE SUMMARY

The Proposal

The Roads and Traffic Authority (RTA) is proposing to upgrade approximately 10 km of the Pacific Highway between Bundacree Creek and Possum Brush (about 140 km north of Newcastle and 22 km south of Taree). The proposal involves the construction of a divided carriageway with two lanes in each direction. An interchange would be provided at Nabiac connecting the Highway to both local and regional roads. The proposed alignment would connect to newly upgraded sections of the Highway to both the north and south.

The proposal has an estimated capital cost of $106 million and forms part of the joint Commonwealth and NSW Governments' Pacific Highway Upgrading Program. The proposal is located within the Greater Taree and Great Lakes local government areas. A locality map and preferred concept alignment of the proposal are given in Figures 1 and 2 respectively.

EIS Exhibition and Approval Process

The RTA, as Proponent, determined that the proposal has the potential to result in significant environmental impacts and accordingly prepared an environmental impact statement (EIS). As the RTA is both the Proponent and a determining authority for the proposal, and an EIS was prepared, the proposal is subject to assessment under Division 4, Part 5 of the *Environmental Planning and Assessment Act, 1979* (EP&A Act). Approval of the Minister is required before the proposal can be determined by the Minister for Roads.

An EIS for the proposal was publicly exhibited between 15 October and 14 November 2001. The Proponent received 32 representations to the EIS which included four objections to the proposal. Noise impacts, business and social concerns, access, flora and fauna impacts and urban design were primary issues of concern.

This Report was prepared in accordance with Section 115C of the EP&A Act which requires the Director-General to assess and report to the Minister on the proposal.

Proposal Justification

The proposal is part of the Pacific Highway Upgrading Program. The Upgrading Program is jointly funded by the Commonwealth and NSW Governments with the main objectives to improve the safety and efficiency of the Highway. The existing Highway between Bundacree Creek and Possums Brush is a two-lane highway with substandard intersections with local roads.

The proposal results in significant improvements to Highway/local road intersections by providing protected intersections, grade separation, service roads, U-turn facilities and turning lanes. Pedestrian and cyclist safety would be greatly improved with the provision of a pedestrian/cycleway through Nabiac and two pedestrian/cyclist underpasses. There would be an increase in the posted speed limit along the upgraded route resulting in improvements to travel time for regional traffic. The provision of dual carriageways would reduce Highway congestion experienced during peak periods, which would also reduce travel times. The upgrading would also contribute to a continuity of road standards along the Highway which would improve safety and vehicle efficiency.

Environmental Impact Assessment

Selection of a preferred route was undertaken in consultation with the community and key agencies and was based on the investigation of nine options (grouped as upgrade, eastern and western bypass options). The main aim of the route selection process was to minimise environmental, social and economic impacts. Notwithstanding, it is inevitable that upgrading the Highway would have the potential for adverse impacts. Key impacts identified were social and economic effects, urban design and landscaping and noise impacts. Identified impacts were generally ameliorated through a range of mitigation measures

Strategic Issues and Policy Implications

The Pacific Highway is the principal transport corridor between Sydney to Brisbane along the NSW coastline. Census statistics indicate that the north coast of NSW is growing at one of the highest rates in Australia. Upgrades to the transport system have not kept pace with the continued population growth leading to a deterioration in Highway performance, particularly safety.

The *North Coast Road Strategy* identified a need to improve the safety and efficiency of the Sydney to Brisbane road corridor. The State and Commonwealth Governments announced a joint *Pacific Highway Upgrading Program* to deliver an improved road corridor. The EIS concludes that the proposal will result in travel time savings, traffic efficiency, road safety improvements and continuity of design standard. The proposal is consistent with the *North Coast Road Strategy.*

Need and Justification

Approximately 43% of the EIS representations indicated overall support for the proposed upgrade. Approximately 12% of representations indicated a preference for an eastern bypass option. The Department acknowledges that the Highway upgrade has implications for some residences along the route but also recognises that any option would have some level of impact. On balance, it is considered that the Highway upgrade represents a more viable option than the eastern bypass because it involves less impacts, particularly ecological, severance and visual impacts.

Social and Economic Issues

Land required for the proposal is largely limited to the existing road reserve but some land acquisition would be required. The community expressed concern about the potential severance of the Nabiac community by a wider, dual carriageway Highway. While accessibility would change, it is considered that the proposed upgrade improves the definition in the road hierarchy and would promote safer road conditions for all motorists. The proposed overpass south of Nabiac would facilitate safer, grade separated east-west traffic movements and the two proposed pedestrian underpasses would provide access between the western and eastern sides of Nabiac.

Concern about the bridge access over Candoormakh Creek on Wallanbah Road has resulted in an agreement between the RTA and GTCC to jointly fund its replacement. The replacement would be undertaken by Council and is separate to this proposal.

A majority of Nabiac business turnover is not generated by Highway users but it is considered important that the village be promoted as a convenient stopping point for Highway traffic. To ensure that Nabiac is promoted to Highway traffic the Recommended Conditions of Approval require that the Proponent address gateway and signage in an Urban Design and Landscaping Report.

Urban Design and Landscaping Issues

The Department commissioned an expert review of the urban design and landscaping proposals in recognition of their importance to the integration of the road with the local rural and urban environment. That review, and the community, highlighted visual impacts, access, gateway treatment, overpass design and significant trees as issues requiring careful consideration. The Department considers that there is scope for the Proponent to address these issues in further detail although the basic principles adopted in the proposal are generally adequate. The Proponent would be required to prepare an Urban Design and Landscaping Report to address these issues as an input into the detailed design.

Noise Impacts

The EIS indicates that construction activities would generate noise levels exceeding the construction noise goals at the nearest residences along the whole route. The Proponent would be required to prepare a Construction Noise and Vibration Management Sub Plan to manage and monitor construction noise.

The EIS concludes that traffic noise levels would exceed the base criteria and allowance criteria at 25 locations. A range of noise mitigation measures were assessed for all affected locations including noise barriers, treatment of individual dwellings (e.g. double glazing) and noise reducing road surfaces. The EIS and Representations Report leaves the selection of operation noise mitigation measures to the detail design phase with input from the affected community.

There is some uncertainty about the noise mitigation measures to be implemented and their effectiveness in meeting assessment criteria at individual residences. Consequently the Department recommends that an Operation Noise Management Report be prepared and submitted for the approval of the Director-General prior to substantial construction to confirm that appropriate noise measures are implemented. The report would include the identification of noise mitigation measures to be used, their method of evaluation and their effectiveness.

The Department also requires that the Proponent undertake operational noise monitoring to assess the adequacy of the implemented traffic noise mitigation measures. Should monitoring indicate a clear trend in traffic noise levels on the proposal higher than the criteria identified in the Operation Noise Management Report, the Proponent would be required to implement further mitigation measures in consultation with affected landowners.

Flora and Fauna

Terrestrial and aquatic flora and fauna issues were the most frequently raised issues in the representations. The EIS concludes that the loss of the proposed 4.16 ha of natural vegetation is not significant as the areas affected are currently roadside vegetation on the periphery of larger areas. The loss of tree hollows was identified in the EIS of being of key importance in the viability of several threatened species. The Recommended Conditions of Approval requires the Proponent to implement a range of compensatory measures for the loss of the tree hollows and to protect threatened species that could be affected by the proposal.

Conclusions and Recommendations

The proposal is recognised as an important component of the Pacific Highway Upgrading Program. This section of the Highway has high traffic volumes during peak periods and a poor accident history. The proposal was developed to address these issues and improve local access and amenity. At the local level, the proposal results in reduced local/regional traffic conflicts and improved safety. The proposal also results in benefits to travelling motorists through increased safety and reduced travel times.

The Department's assessment identified many benefits associated with the proposal. It also concluded that constructing the Highway through Nabiac would require comprehensive urban design and landscaping strategies, including gateway and signage treatments, and careful management of noise impacts, both construction and operation. These elements would need to be fully integrated to optimise the advantages of the proposed Highway upgrade for the residents of Nabiac.

The Department has recommended that the Proponent prepare comprehensive Environmental Management Plans (EMPs) for the construction and operation stages of the proposal which embody the mitigation measures contained in the EIS, Representations Report and the Recommended Conditions of Approval. The key elements of the Recommended Conditions of the Approval include:

- preparation of an Urban Design and Landscaping Report that presents an integrated urban design concept for the project;
- preparation of an Operation Noise Management Report;
- implementation of noise and vibration mitigation measures during construction and ongoing monitoring of noise levels;
- implementation of flora and fauna mitigation measures during and post construction;
- the preparation of detailed Sub Plans as part of the EMP for:
  - construction traffic
  - urban design and landscaping
  - indigenous and non-indigenous heritage
  - noise and vibration
  - soil and water quality
  - acid sulphate soils
  - flora and fauna
  - dust management
  - spoil and fill management
  - hazards and risk management
  - waste management and re-use.

The Department's assessment concludes that, provided the Recommended Conditions of Approval contained in Section 8 of this Report are adopted, the proposal could be approved by the Minister.

1. INTRODUCTION

1.1 Nature of the Proposal

The Roads and Traffic Authority (RTA) proposes to upgrade the Pacific Highway between Bundacree Creek and Possum Brush through Nabiac which lies about 140 kilometres north of Newcastle. The proposal comprises:

- a dual carriageway for the length of the proposal;
- an overpass on the southern side of Nabiac;
- turning facilities at Glen Ora Road, Clarkson Street North and for vehicles up to 12 metres long at Pipe Clay Creek Road;
- twin bridges over Pipe Clay Creek; and
- a new bridge and footway over the Wallamba River for southbound traffic.

A locality map and preferred concept alignment of the proposal are given in Figures 1 and 2 respectively.

1.2 EIS Exhibition and Approval Process

The Proponent determined that the proposal has the potential to result in significant environmental impacts and accordingly prepared an environmental impact statement (EIS). As the RTA is both the Proponent and a determining authority for the proposal, and an EIS was prepared, the proposal is subject to assessment under Division 4, Part 5 of the *Environmental Planning and Assessment Act, 1979* (EP&A Act) and the approval of the Minster is required.

An EIS for the proposal was publicly exhibited between 15 October and 14 November 2001. The Proponent received thirty two (32) representations to the EIS. Copies of all representations were forwarded to the Department as required by the EP&A Act, 1979.

1.3 Request for Approval of the Minister of Planning

In accordance with Section 115B of the EP&A Act, the RTA sought the approval of the Minister by way of letter dated 20 December 2002. The request for approval was accompanied by a Representations Report which presented the RTA's response to the issues raised in response to the public exhibition. The Representations Report notes that no modifications to the activity as described in the EIS are proposed. Accordingly, the Proponent has not prepared a Prescribed Activity Report.

1.4 Purpose of this Report

The purpose of this report is to review the EIS for the proposal, the issues raised in representations to the public exhibition, submissions made by the Proponent and other matters pertinent to the potential impact of the proposal.

This report has been prepared in accordance with Section 115C of the EP&A Act, which requires the Director-General of the Department to assess and report to the Minister on the proposal. This Report documents the outcome of an independent environmental impact assessment by the Department accounting for all issues raised in representations to the EIS.

2. THE PROPOSAL DESCRIBED IN THE EIS

This section provides a description of the Proposal described in the EIS. It provides an overview of the information presented in the EIS and does not necessarily represent the views of the Department. The Department's consideration of the modified Proposal is provided in Sections 5 and 6.

2.1 Introduction

The proposal consists of the construction and operation of approximately 10 kilometres of dual carriageway on the Pacific Highway through Nabiac which lies about 140 kilometres north of Newcastle. The proposal runs from Bundacree Creek to Possums Brush north and south respectively of the Nabiac village. It includes an overpass to accommodate movement between the east and west sections of the village. The following sections provide details of the key elements of the proposal.

2.2 Proposed Alignment

The proposed horizontal alignment was constrained by:

- the 1:100 ARI flood level beyond the Nabiac township in the east;
- agricultural and nature reservation lands on the eastern flanks of the village; and
- dairying and potential redevelopment areas west of Nabiac.

The alignment of the Bundacree Creek to Possum Brush proposal is illustrated in Figure 2 and comprises:

- the road between Bundacree Creek to south of Minimbah Road stays within the existing road reserve;
- a diversion of the route to the west from south of Minimbah Road to north of Glen Ora Road;
- the existing bridge deck over the Wallamba River is to be replaced but the support structure retained to form part of the northbound carriageway. A new bridge is constructed for the southbound carriageway;
- the road stays within the existing road reserve between Wallamba River and Woosters Lane except at Nabiac where property acquisition on the western side is required;
- an interchange at Nabiac which allows for movements between Wallanbah Road and Clarkson Street South. Ramps are provided for all movements to and from the new Highway;
- the northbound carriageway of the upgraded Highway to deviate to the west between Wooster's Lane and Pipe Clay Creek to avoid a number of trees that have habitat significance;
- the Proposal moves slightly to the east and west of the existing route between Pipe Clay Road and Carefree Road;
- at Carefree Road, the southbound carriageway would be constructed over the existing road;
- near Failford Road both carriageways would connect to the existing dual carriageway.

2.3 Carriageway Design

The proposal was designed to comply with all relevant RTA design criteria. Table 1 outlines the key design features of the proposal.

Table 1 – Key Design Features of the EIS Proposal

Speed	110 km/hr
Traffic Lane Width	3.5 m
Shoulder width	2.5 m – 3.0 m
Median	Variable between 3 m and 25 m
Turning Lane Width	3.5 m

Other design features include:

- four cross overs proposed to allow north and southbound on a single carriageway traffic flow while construction is in progress;
- four emergency telephone bays: two on the northbound carriageway and two on the southbound carriageway
- off-highway pedestrian and cycle paths connecting Nabiac to the residential area to the south-east;
- improved facilities for local and interstate buses; and
- truck parking facilities.

2.4 Bridges

Five bridges would be constructed between Bundacree Creek and Possum Brush, including the:

- new Wallamba River southbound bridge which involves 200 m of dual carriageway and the demolition of the deck and truss structure of the existing bridge and its replacement;
- Nabiac Overpass, at Nabiac village linking the western hinterland with the village. The length of the overpass is 65 m. Access from the southbound carriageway to areas west of the Highway is made via an off-ramp and the overpass, without the need to enter the village although this option is also available. Access from the northbound carriageway to Nabiac is via an off-ramp south of the Ampol Service Station and then the overpass; and
- new northbound and southbound bridge system over Pipe Clay Creek, 30 m in length.

2.5 Access Arrangements

2.5.1 Local Access Arrangements

The proposal incorporates upgrades to existing intersections and a number of changes to local traffic arrangements.

Northbound access to the Highway at Nabiac would be located off Wallanbah Road. Access from the west of the Highway to the east would be via Candoormakh Creek Road roundabout and then the overpass which connects with Clarkson Street.

Access from Clarkson Street to the southbound access road and overpass is provided with an intersection. Access to the truck parking area would also be available from that intersection.

Traffic volumes entering or crossing the Highway at Minimbah Road, Glen Ora Road, Clarkson Street North, Brushgrove Park Road, Pipe Clay Creek Road and Carefree Road are small. Full U-turning facilities with median storage are proposed at three of these locations:

- Glen Ora Road;
- Clarkson Street North; and
- Pipe Clay Creek Road.

The existing intersection of the Highway at Failford Road would not be affected by the proposal.

All other Highway intersections with local roads would be reconstructed to be "left in, left out" configuration. The intersection of Hoskins Street with the Pacific Highway would be closed to traffic.

Access to and from the Failford Cemetery would be restricted to "left in, left out" from the northbound carriageway.

2.5.2 Access Arrangements for Private Dwellings

There are numerous locations where property access is available along the Highway. Access will be maintained for all properties but limited to left in/left out, with U-turn facilities provided at the major intersections.

2.5.3 Pedestrian Underpasses

There are two pedestrian underpasses in the proposal:

- north of Wallanbah Road to connect the area in the vicinity of the existing Ampol service station with the village; and
- at the junction of the Pacific Highway and Hoskins Street/Hardy Road intersection to connect the village on the east side of the Highway with the Caltex service station and caravan park on the west side.

2.6 Other Design Issues

Other design features of the proposal include:

- fencing to prevent unauthorised access and safety barrier fencing in medians and along sections of the highway to minimise conflict between wildlife and vehicles;
- noise attenuation measures where required;
- new lighting in accordance with the RTA Draft policy "*Pacific Highway – Lighting of Intersections*" and AS1158.0:1997; and
- signposting in accordance with RTA policy and in consultation with the Great Lakes and Greater Taree Councils.

2.7 Property Acquisition

The area required for the project is largely limited to the existing road reserve but the RTA would need to acquire land from 55 properties. The total land area to be acquired is 52.85 ha. Of the 55 properties, five are total acquisitions required for road construction. An additional two total acquisitions would be required although the whole of the properties are not required for road construction. All property acquisitions identified at the final design stage would be undertaken in accordance with the provisions of the *Land Acquisition (Just Terms Compensation) Act* 1991.

2.8 Construction Issues

The RTA has identified the main construction tasks as follows:

- pre-clearing identification of significant flora and rescue of significant fauna;
- site establishment, including areas for ancillary facilities;
- clearing and grubbing of vegetation and mulching of plant material for re-use;
- installation of temporary erosion, sediment and water quality controls including diversion drainage;
- stripping, stockpiling and management of topsoil;
- relocation of public utilities;
- bulk earthworks;
- foundation treatments;
- construction of Wallamba River bridge;
- construction of Nabiac overpass;
- installation of drainage lines;
- construction of local property access and local road access points;
- pavement construction;
- topsoiling and revegetation of batters and berms;
- landscaping;
- installation of noise attenuation measures;
- line marking and signposting;
- intersection lighting; and
- finishing works (including general site clean-up and removal of site compounds).

Construction is anticipated to take approximately 3.5 years with construction of the Wallamba River bridges expected to take at least 12 months and the Nabiac overpass at least 6 months. Staged construction may be necessary to deliver the bridge structures and approaches. No sidetracks are proposed and where possible, one carriageway would be constructed first and traffic transferred to that carriageway while the second one was built. The construction schedule would be developed in detail with the contractor selected to undertake the work.

The project will have a deficit of earthworks materials. Approximately 240,000m^3 of pavement material and 555,000m^3 of select and general fill materials will need to be imported. All material will be obtained from existing sources.

A site compound, batching plant and stockpiles sites would be associated with the works. Pile driving would be associated with some bridge works.

Proposed construction times are 7.00am to 6.00pm on weekdays and 7.00am to 1.00pm on Saturdays. There may be construction outside normal working hours depending on the sensitivity of the works and of the area.

The estimated capital cost of the proposal is $106 million.

3. SUMMARY OF REPRESENTATIONS

3.1 Summary of EIS Representations Received

Thirty two (32) representations were received in response to the public exhibition of the EIS. Ten of these representations included pro-forma comment forms, three of which had letters attached. There were no petitions. Representations sources are summarised below:

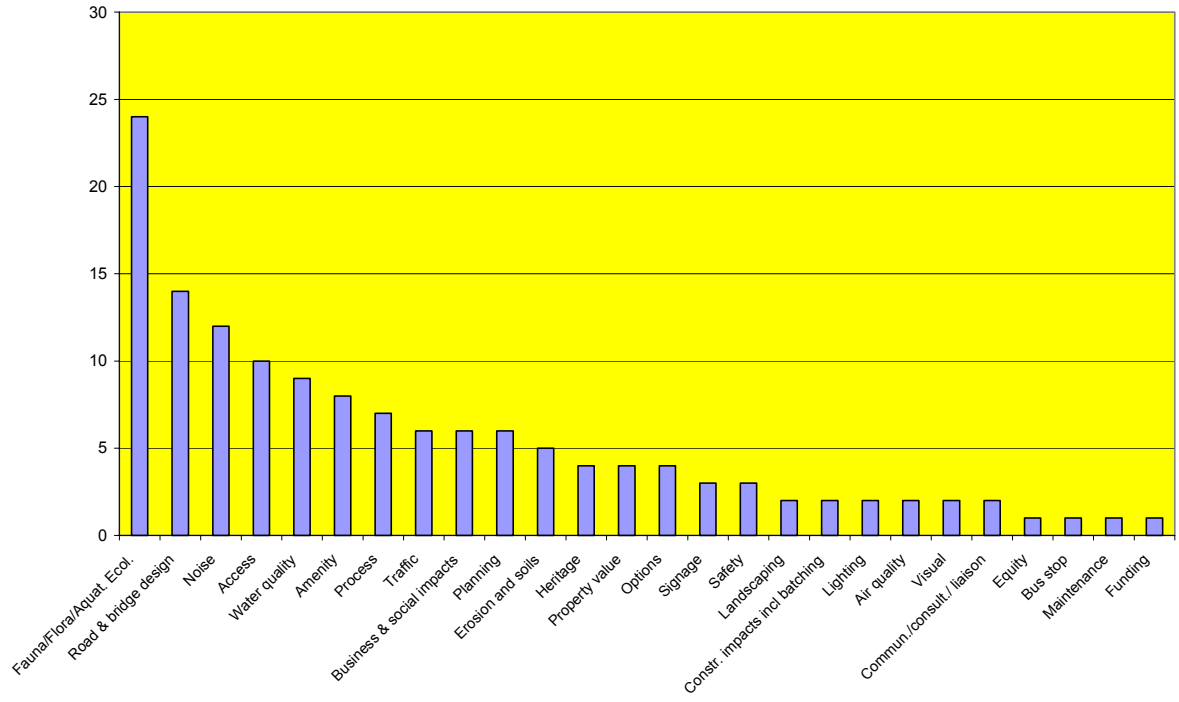
Commonwealth Government	1
State Government	11
Local Government	2
Business	3
Individuals	15
Total	32

Of the representations received, four stated clear support for the proposal, fourteen stated in principle support and four objected to the proposal mainly because of the alignment through Nabiac. 43% of representations stated their in-principle support for the proposal.

3.2 Identification of Issues from representations to the EIS

In its Representations Report, the Proponent included a summary of the issues raised in the representations to the EIS, which categorised issues into 34 categories. The Department has undertook an independent assessment of issues raised in representations and generally concurs with the Proponent's interpretation. Figure 3 provides the Department's summary of the frequency of issues raised in representations.

Figure 3 Identification of Issues in Representations



A summary of the representations from Commonwealth, State and Local Government agencies is presented in Table 3.1.

Environment Australia requested amendment of the EIS to consider EPBC Act listed migratory and threatened species.

The DLWC (now DIPNR) requested additional information on wetlands along the corridor and management options should these be impacted by the proposal. Recommendations about the management of potential acid sulphate soils (PASS), should excavation be deeper than proposed, were provided by the DIPNR.

MidCoast Water raised the issue of the potential environmental impact from the proposal on drinking water aquifers in the region and water and sewerage assets in Nabiac.

The EPA noted concern over the accuracy of noise modelling and the need for post-construction noise monitoring. EPA recommended the installation of acoustic treatments prior to the commencement of construction. The EPA considered that the identified erodibility and dispersion potential of the soil pose a risk to off-site water quality and therefore recommend environmental control structures.

NSW Fisheries expressed concern at the lack of information provided on the level of activity of aquaculture, commercial and recreational fishing within the study area.

The Waterways Authority advised of minimum clearance requirements for bridges over waterways.

Heritage Office indicated support for the mitigation measures outlined in the EIS.

The Greater Taree City Council expressed concern at the rejection of the eastern bypass option and the impact of the proposal on the village of Nabiac.

The Great Lakes Council expressed the need for landscaping and urban design to reduce the impact on Nabiac and residents. Council noted concern about the standard of maintenance proposed for highway verges and structures. Council considered that the deferred grade separated intersection at Failford Road should be constructed as part of this project.

Table 3.1 Summary of the representations from Commonwealth, State and Local Government agencies

Issues/Agencies	Environment Australia	DIPNR (formerly DLWC)	EPA	NSW Fisheries	Mineral Resources	NPWS	DoT	NSW Agriculture	Heritage Office	Waterways Authority	Midcoast Water	Transgrid	Greater Taree City Council	Great Lakes Council	TOTAL
Road, Bridge and Culvert Design				X		X				X			X	X	5
Flora, fauna & aquatic ecology	X	X		X		X									4
Communication/ consultation/liaison				X			X			X	X				4
Erosion, Soils and Geology		X	X	X	X										4
Construction Impacts	X		X					X	X						4
Signage										X			X	X	3
Access							X						X	X	3
Amenity and Landscaping						X							X	X	3
Water Quality			X	X							X				3
Process			X					X							2
Planning						X							X		2
Business & social impacts													X	X	2
Utilities											X	X			2
Heritage									X						1
Noise and Vibration			X												1
Property values													X		1
Options													X		1
Air quality			X												1
Visual													X		1
Equity													X		1
Funding											X				1

The following section provides an overview of the main issues raised in the EIS representations.

3.2.1 Flora, fauna and aquatic ecology

Terrestrial and aquatic flora, fauna and ecological issues were the most frequently raised issues in the representations. Major concerns were the:

- need for additional study into a number of species and threatening processes included under TSC Act since the EIS was prepared. There are similar species also listed under the EPBC Act since the EIS;
- impact on fauna and the need to reconsider the proposed fauna exclusion fencing;
- need to consider both aquatic flora and fauna and also the inclusion of riparian fauna underpasses in the design of waterway crossings;
- implications of the proposal on the flora and fauna habitats of the region;
- need to map the area's hollow bearing trees;
- monitoring programs, which were supported, but required further discussion with relevant agencies; and
- need to refine revegetation and landscaping plans.

3.2.2 Road and Bridge Design

Key issues raised included:

- various suggestions to improve intersection design, location and property access;
- provision of U-turn access and concerns regarding safety on Highway;
- the need for a roundabout at Nabiac Street;
- the proposed new entry at the southern end of Clarkson Street and implications for high traffic numbers;
- if the eastern bypass is not pursued, then an upgrade of the Candoormakh Creek Bridge on Wallanbah Road should be included in the proposal;
- concern about a complex and highly engineered interchange and its relationship with Wallanbah Road for regional access; and
- minimum clearances under bridges.

3.2.3 Noise

The EPA representation raised the following:

- the accuracy of the EIS modelling. The EPA stated that the accuracy of the modelling used was marginal;
- the assessment criteria for operational noise should be met at all residences including those identified as "marginally affected"; and
- an incorrect construction noise objective was identified in the EIS.

Issues raised by other representations included:

- traffic noise impacts from highway upgrade;
- specific noise impacts on local residences and need for noise mitigation measures;
- the accuracy of construction noise impacts outlined in EIS;
- noise impacts from existing RTA depot;
- lower the depth of roadway and use landscaping for local traffic noise mitigation;

- retention of existing mature trees for noise mitigation;
- installation of noise reduction devices prior to construction; and
- selection of a road surface that reduces noise impacts.

3.2.4 Access

Issues raised included:

- access at Nabiac Street directly from Highway should be maintained;
- the ease of traffic movement into Nabiac is important to the preservation of the village centre;
- the location of pedestrian underpass and proximity to village;
- proximity to local bus stops on the Highway;
- provision should be made for pedestrians, cyclists and horse riders to travel safely over the Highway from Candoormakh Creek South Road and from Candoormakh Crescent;
- pedestrian access to the overpass at Nabiac is required;
- the EIS fails to address the importance of Wallanbah Road as a major regional access road; and
- access between the western side of the Highway at Nabiac and the village is important.

3.2.5 Water quality

Issues raised included:

- EIS does not mention the potential impact on the Nabiac aquifer to be used as drinking water;
- spillage management structures should be installed on the eastern side of the Highway;
- a soil and water management plan must be prepared prior to works commencing and include an erosion and sediment control plan;
- design and implementation of proposed environmental control structures and techniques on-site must reflect the identified erodibility and dispersion properties of the soils;
- justification should be provided within the plans for adopting the control structure design capacities and stability criteria;
- the RTA should develop and implement a spill basin maintenance program prior to the project opening to traffic and ensure they continue to operate as intended;
- appropriate dewatering procedures should be developed prior to excavation commencing in areas impacted by groundwater to ensure pollution does not occur;
- the EPA considered that additional monitoring should be undertaken on potentially impacted streams prior to construction and data used to refine the parameters that need to be monitored during construction; and
- the EPA recommends that RTA apply for an Environment Protection Licence for Miscellaneous Licensed Discharge to water (wet weather only).

3.2.6 Amenity

Issues raised included:

- support for efforts to retain the ambience of Nabiac village;
- effort should be made to enhance the acceptability of the Nabiac village streetscape to locals and tourists;
- a request to maintain mature trees for screening purposes; and
- urban design impacts on the village of Nabiac are likely to be more significant than those stated in the EIS.

3.2.7 Process

Issues raised included:

- concern about the Value Management Study process;
- Value Management Study ignored requests to consider a bypass option;
- prolonged deliberations and changes to the Highway proposal have had an unsettling effect on resident lifestyle, plans etc; and
- disenchantment with the Highway selection process.

3.2.8 Traffic

Issues raised included:

- local traffic travelling into Nabiac should be favoured. The ease of traffic movement into Nabiac is important to the preservation of the village centre;
- the present design has still not addressed the local traffic problem to its full extent;
- a request for the Highway speed limit to be 80km/hr;
- more traffic will use Clarkson Street entry and the Y intersection at Nabiac and Clarkson Street outside Robbe Co, which is currently a problem; and
- it is important that local bus operators and Department of Transport are kept informed of developments so that impacts on current and future bus services can be monitored.

3.2.9 Business and social impacts

Issues raised included:

- traffic and alterations in and around Nabiac should not interfere with the business of the town;
- concern about the impact of the Highway upgrade on the survival and continued prosperity of Nabiac;
- the economic future of Nabiac is in three areas: expansion of residential areas, rural subdivision and utilisation of its tourist potential. This potential cannot be realised with the current proposal;
- the EIS inadequately addresses the social and economic impacts on the vibrant and growing community of Nabiac and its hinterland; and
- complex engineering has the potential to spoil many of the delightful qualities of Nabiac and its hinterland, while speculating that Highway travellers will stop and utilise the town's services.

4. JUSTIFICATION, ALTERNATIVES CONSIDERED AND IMPACTS IDENTIFIED IN THE EIS

This section discusses the project need and justification described in the EIS and outlines the alternatives considered and the potential adverse and beneficial impacts of the proposal identified in the EIS. This section does not necessarily reflect the views of the Department. The Department's assessment of issues associated with the proposal is contained in Sections 5 and 6.

4.1 Justification and Need for the Proposal

The Pacific Highway is the principal transport corridor connecting Sydney to Brisbane along the NSW coastline. Census statistics indicate that the north coast of NSW is growing at one of the highest rates in Australia. Upgrades to the transport system have not kept pace with the continued population growth leading to a deterioration in Highway performance, particularly safety.

The section of Highway from Nabiac to Failford Road also functions as an arterial road for travel to Forster/Tuncurry for residents of Nabiac and district and areas further west such as Krambah and Gloucester. It carries a mix of local, regional and interstate traffic, which is expected to increase.

Sections of the Highway to the north and south of the study area have recently been upgraded. The existing Highway within the project area is a single carriageway, two-lane road with limited overtaking lanes, narrow shoulders and a substandard vertical and horizontal alignment. The accident rates for this section of the Highway are currently lower than the state average, but the most common type of accident with fatalities or serious injury are head-on collisions. Without improvements, the current mix of traffic would result in a continuing deterioration of service levels, amenity and safety.

The *North Coast Road Strategy* identified a need to improve the safety and efficiency of the Sydney to Brisbane road corridor. The State and Commonwealth Governments announced a joint *Pacific Highway Upgrading Program* to upgrade the Pacific Highway to deliver the improved road corridor. The benefit and justification of the upgrade lie in anticipated accident reductions, transport efficiency improvements and vehicle operating cost savings.

4.2 Consequences of Not Proceeding

The EIS identified the following consequences of the do-nothing option:

- a reduction in efficiency and safety along the Highway as a result of discontinuity of standards between Hexham and the Queensland border;
- continuing and possibly increasing accidents and severity;
- increasing conflict between through and local traffic; and
- increasing congestion on the Highway particularly during peak holiday periods.

4.3 Alternatives Considered

In 1994 an EIS was completed assessing various route corridors for a Motorway between Possum Brush and Coolongolook. Four route corridors were assessed which included a corridor to the west of the existing alignment, an upgrade of the existing Highway and two options east of the existing Highway. That project was abandoned in August 1996 but information collected for the project formed

reference material for this project. An alternative to the Motorway project was the incremental upgrade of the Highway to a dual carriageway.

The study area for this proposal was subsequently revised and 11 route options investigated. The routes were nominal corridors of land for assessment purposes and included routes to the western and eastern sides of the existing Highway or an upgrade of the existing Highway with various overpass options.

A number of strategic criteria were identified as considerations in the selection of route options. These criteria include agricultural productivity, natural resources, severance, visual effects, noise, heritage, flora and fauna, aquatic ecology, air quality, geotechnical constraints, hydrology, traffic and economic factors.

An upgrade of the Highway, basically on the existing alignment, was selected as the preferred option. It was considered to have the least overall impact on the identified environmental, economic and social factors.

4.4 Major Benefits and Adverse Impacts Identified in the EIS

The EIS states that the proposal would achieve the following:

- improvements in the safety of this section of the Pacific Highway;
- provision of a long-term carriageway able to carry freight transport including B-doubles and other heavy vehicles; and
- improved ecological viability through provision of bridge crossings and realignment to avoid habitat isolation.

The EIS recognises that the construction and operation of the proposal would create a range of adverse impacts including:

- noise and vibration impacts;
- removal of natural vegetation;
- heritage impacts in the vicinity of Wallamba River bridge and at Wooster's residence and the former butchers shop;
- visual impact; and
- property acquisition.

These impacts are discussed in more detail below.

4.4.1 Noise and Vibration Impacts

Construction noise levels were anticipated to exceed EPA noise guidelines at the closest residences along the whole alignment. This would be most noticeable in the areas of cut and fill. Residences in Wallanbah Road and residences in the vicinity of bridge construction areas were identified as being particularly affected. Vibration from vibratory rollers would be experienced at residences within approximately 50 metres of the construction zone.

Existing Highway noise exceeds the EPA's *Environmental Criteria for Road Traffic Noise* (1999) (ECRTN) noise goals at a number of residences. Modelling of the proposed upgrade identified other locations where the criteria would be exceeded from either realignment closer to properties or in areas of fill where the increase in elevation enables noise to travel further.

4.4.2 Removal of natural vegetation

About 5.7 ha of natural vegetation would be lost or isolated within the median. Thirteen hollow-bearing trees would be removed.

4.4.3 Heritage Impacts

Indigenous archaeological sites may exist in the vicinity of the Wallamba River crossing in an area which is potentially affected by bridge works. Wooster's residence and former butcher's shop would be removed and Failford Cemetery would be affected by the proposed alignment.

4.4.4 Visual Impact

A number of features of the proposal would affect the visual qualities of the corridor. These are the overpass just south of Nabiac, noise walls, if included in the design, areas of cut and fill and changes to the road width.

4.4.5 Property Acquisition

Acquisition is required from 55 properties. Seven dwellings would be acquired and five of these would require demolition.

5. ASSESSMENT OF THE PROPOSAL'S KEY ISSUES

This Section of the Report provides an assessment of the key environmental impacts of the Proposal based on an examination of the EIS, issues raised in representations made during the exhibition period and the Proponent's response to these issues presented in its Representations Report and during further consultation with the Department.

The Proponent also provided the Department with an assessment of issues raised in representations in its Representations Report. The assessment was reviewed by the Department and, where required, further assessment undertaken. It is important that this Section and Section 6 be read in conjunction with the Representations Report to understand how all issues raised in representations were addressed.

5.1 Need and Justification/Alternatives

5.1.1 Background

The primary objectives of the proposal stated in the EIS were to:

- provide four travel lanes with separation of opposing traffic flows along the entire length of the project;
- improve traffic management and pedestrian safety along the Highway near Nabiac village;
- provide full access to the dual carriageway via T-intersections with major side roads and provide U-turn facilities at suitable intervals;
- improve safety for all road users;
- reduce travel times;
- maximise environmental benefits;
- improve the inter-regional functions of the Pacific Highway corridor; and
- provide a cost-effective solution.

The proposal was justified in the EIS on the basis that it best meets these objectives. Further background information on the project's need, justification and alternatives was provided in section 4 of this report.

5.1.2 Key Issues Raised

Of the 32 representations, there were 14 (43%) that documented their in-principle, overall support for the proposal. Those who specifically stated their objection to the proposal numbered 4 (12%). The majority of these respondents acknowledged the justification and need for road improvements but indicated a preference for an eastern bypass of Nabiac.

Key issues of concern about the Proposal's need and justification/alternatives include:

- alternative design preferred for proposal in relation to interconnection with east-west regional road;
- alternative routing preferred including realignment of Highway and local roads, eastern bypass option and service centre locations;
- routing selection procedures; and
- safety of proposed alignment in comparison to a bypass.

A number of the representations supporting the proposal raised concerns about:

- property impacts resulting from the close proximity of the upgraded road to some local residences;
- accessibility for local residents in and around Nabiac and to local properties; and
- socio-economic impacts on the Nabiac village and the need to promote the village as a service centre through urban design, gateways and local access arrangements.

5.1.3 Consideration of Key Issues

Strategic Policy Objectives

The *North Coast Road Strategy* (1992) identified the need to improve the Sydney to Brisbane road corridor and considered two alternatives for the delivery of that improvement. One method involved a new high standard road separate from the existing Pacific Highway, while the other involved gradual improvement of the existing Pacific Highway. In 1996, the Commonwealth and NSW State Governments agreed to increase funding for the gradual improvement.

The *Pacific Highway Funding Program* was subsequently developed and its main objectives centred on improvement of safety and efficiency of the existing Highway.

The proposed Highway upgrade between Bundacree Creek and Possum Brush is consistent with Government strategy and road programming.

Route Selection Process

In 1997 the RTA developed a total of 11 route options, five on the eastern side of the existing highway, three on the western side of the highway and three were an upgrade of the existing highway. The routes were nominal corridors of land broadly defined for assessment purposes and were developed after a constraint mapping process. The route selection process was backed by Value Management Studies, public displays and consultation with the public, peak bodies and other interested parties. The options for a bypass to the east were found to have severe ecological impacts. The options for a western bypass were also found to have significant environmental impacts and were strongly opposed by GTCC due to incompatibility with future plans for development. The results of the consultation processes indicated strong support for an Option 9 which involved an upgrade of the existing Pacific Highway (the current proposal).

Some representations stated that the eastern bypass options would provide a better alternative to an upgrade of the existing Highway because these were less disruptive for Nabiac and residents lifestyles.

The Department acknowledges that an upgrade of the existing Highway has implications for some residences along the route including land acquisition, increased noise impacts and altered access arrangements. However, it is considered that the upgrade of the existing Highway represents a more viable option than an eastern bypass because of reduced impacts, particularly ecological, severance and visual issues.

Safety of the Preferred Option

Some representations were concerned that the upgrade of the existing Highway through Nabiac would detrimentally affect the village's amenity. Nabiac currently experiences safety problems, especially in

peak holiday periods, related to the interaction of local, regional and interstate traffic. A bypass of the village would result in total separation of these traffic types and take Highway traffic away from the village. However, an upgrade of the existing Highway and the proposed access arrangements in and out of Nabiac for local and regional traffic will fundamentally provide similar benefits while both maintaining the existing village centre and also facilitating village access to passing traffic.

5.1.4 Conclusions

The Department recognises that the proposal to upgrade the existing Highway will involve impacts on some local residences especially in the vicinity of the Nabiac village but this option provides a considerable reduction in environmental, social and economic impact overall compared to bypass options of the Nabiac village. The Department concludes that these impacts can be managed to acceptable levels, subject to the Recommended Conditions of Approval.

5.2 Social and Economic Issues

5.2.1 Background

The EIS identified that the development of the proposal would have a number of social impacts on the community. The community can be considered at several levels, the broader regional community, the community of Nabiac village and its surrounds and the individuals affected directly and indirectly by the proposal. Social impacts include:

- amenity considerations; e.g. noise level effects on a number of dwellings, visual intrusion of noise barriers, treatment of interchanges, gateways, pedestrian underpasses and integration of landscaping with the surrounding environment;
- safety and access considerations; e.g. separation of through traffic from local traffic (via the overpass) would improve safety on the existing highway particularly during peak traffic periods and reduce conflicts between pedestrians, light and heavy vehicles; and
- property effects; e.g. some property acquisition will be required and properties along the proposed route will be affected during construction and operation.

The EIS included details of a survey of business establishments undertaken in 1998 to identify the contribution of the Pacific Highway to the economic base of Nabiac. The survey included direct surveys of 30 businesses, with 16 businesses responding from the following sectors: retailing/wholesaling, motor vehicle services, accommodation, cafes, restaurants and other services.

The EIS states that 13% of the total annual turnover of Nabiac business establishments was generated from the Highway. Five businesses accounted for over 90% of Highway-related turnover. It was also noted that Highway related turnover has increased since the survey. The increase appears to be a reflection of an increasing proportion of through traffic finding Nabiac a convenient stopping point, due to the completion of Highway upgrade projects to both the north and south.

Respondents to the survey were also asked to identify the most important factors contributing to the viability of their business and to the future economic development of Nabiac. The majority of respondents felt that easy access to Nabiac village was essential to maintain business viability, with some respondents adding parking as also important. Most respondents also felt, for future economic development, that signage and maintaining (and enhancing) the attractiveness and ambience of Nabiac as a rural village were important.

The mitigation measures for Bundacree Creek to Possums Brush discussed as part of the EIS include:

- appropriate signage and 'gateway' treatments promoting the range of facilities within Nabiac;
- active promotion of Nabiac as a stopover destination for visitors by the local business community in cooperation with Council and tourism authorities (not part of this proposal); and
- the potential private development (not part of this proposal) for a new Highway service centre at existing service station sites to promote short-term visitation to the village.

The area of the Highway upgrade would be largely limited to the existing road reserve although some land acquisition will be required. The upgrade would require acquisition of 52.85 ha of land for road construction. Acquisition of varying percentages of 55 properties will be necessary and details are outlined in Section 14.0 of the EIS.

The EIS concludes that the negative land use impacts of the proposal could be reduced by:

- compensating land owners in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991* and the RTA's *Land Acquisition Policy*;
- provision of alternate property access and adjustments in consultation with the land owners;
- reinstatement of local drainage and avoidance of exacerbating flood conditions; and
- installation of comprehensive landscape treatments.

The EIS includes the results of a Road User Cost-Benefit Analysis and Benefit Cost Ratio analyses. The net present value was made up of capital costs, infrastructure maintenance costs, changes in vehicle operating costs, changes in travel time for users and changes in accident rates.

The benefits of the proposal, as described in the EIS, result from vehicle operating savings, travel time savings and accident savings. The EIS indicates that the Net Present Value of benefits outweigh costs by $2.67 million. Therefore in economic terms the proposal has the benefit to cost ratio of 1.04 with an internal rate of return of 5.7%. The results of the cost-benefit analysis were considered conservative.

5.2.2 Key Issues Raised

Key issues raised in relation to the EIS include:

Access

- economic benefit for the town due to easier access for Highway traffic;
- provision needs to be made for horse riders to travel safely over the Highway from Candoormakh Creek South Road and from Candoormakh Crescent;
- need to improve access to Clarkson Street;
- access to Nabiac Street from highway should remain open;
- inconvenient location of pedestrian underpass and proximity to bus stops;
- pedestrian access to the overpass at Nabiac is required;
- concern about the location of school bus stops; and
- alignment of Wallanbah Road should favour local traffic travelling into Nabiac.

Safety

- need to improve safety at intersections along the Highway;
- proposed alignment reduces safety compared to a bypass; and
- mixing of slow moving traffic with high speed traffic would be a significant safety issue compared to a bypass option.

Socio-economic

- funding should be allocated to minimise negative impact of the Highway on the town's businesses;
- Highway should not interfere with the business activities of Nabiac;
- Highway-related business is not a high percentage of turnover for most businesses. Local trade is more important;
- Highway upgrade poses a restriction on the economic growth potential of Nabiac;
- impact on local businesses during construction period; and
- special attention should be paid to signage of the exits to Nabiac to encourage tourists to visit.

The GTCC representation to the EIS raised a number of issues about access, social and economic aspects:

- failure of the proposal to address unsafe and difficult bridge access over Candoormakh Creek;
- EIS does not address the specific issue of the location of this section of the Highway as the intersection of a major regional road (MR90) which connects the New England region to the coast at Nabiac;
- EIS inadequately addresses the social and economic impacts on Nabiac and its hinterland; and
- proposal would form a barrier to development of the western side of Nabiac.

The GLC representation to the EIS raised a number of issues in regard to access:

- considered essential for provision to be made for pedestrians on the Nabiac overpass;
- overpass should be directly linked into Clarkson Street.

5.2.3 Consideration of Key Issues

Severance and Local Access

The proposed design introduces an overpass on the southern outskirts of Nabiac which will separate local and Highway traffic. The overpass provides for local connectivity and improved highway access without having to rely on an at grade full intersection in Nabiac. The overpass facilitates east-west vehicular access and caters for regional traffic movements. The design responds to community requests for improved and safer connectivity than currently exists. This is proposed to be achieved by pedestrian and vehicular cross connectivity via two underpasses and an overpass respectively.

The EIS indicates that the community of Nabiac already experiences some severance issues associated with the existing Highway resulting in impacts on local amenity, community function and accessibility. The community raised concern over a number of potential local accessibility and severance issues. GTCC expressed concern about potential fragmentation of the community by the broad Highway corridor. GTCC also consider that the complex interchange will not ensure easy access and will directly and unacceptably harm the attractiveness and ambience of the village.

The main disadvantage of the proposal is that it has the potential to further divide the community of Nabiac by wider, median separated carriageways and increased traffic. The extent of the area required for the upgrade of the Highway is limited largely to the existing road reserve but some land acquisition is required.

The proposed overpass and pedestrian underpasses provide local access opportunities but would require careful investigation and consideration during detailed design. The Proponent would need to

carefully manage connectivity and amenity improvements around Nabiac to ensure that the proposed benefits of the proposal (ie. safety, accessibility and amenity) are captured to the greatest extent possible.

The Department also notes that existing local access and congestion could be affected during construction. Management measures to ensure that construction stage traffic impacts are minimised to the greatest extent possible are discussed in Section 6.4.

While the Department acknowledges that residents within and surrounding Nabiac would benefit from a clearer road hierarchy and safer access and connectivity, the proposal would introduce impacts on a number of residences.

There are several related issues. Urban design and landscaping improvements are discussed in Section 5.3 of this Report. Noise and vibration impact management measures are discussed in Section 5.4. The Department considers that community severance impacts associated with the proposal could be managed to acceptable levels subject to the management measures detailed above and in the other sections referenced.

Safety

An overall objective of the Pacific Highway upgrade program is to improve safety by reducing the number of intersections where vehicles turning from side roads must cross traffic in two directions. For this section of the Highway this is proposed to be achieved through the provision of a number of U-turn facilities with deceleration lanes, and also the overpass. The overpass at Nabiac connects Wallanbah Road with the eastern side of Nabiac and provides a complete separation of local and Highway traffic. This creates improved safety for vehicles compared to the current at grade intersection.

The proposal also provides for improved definition in the road hierarchy to the current arrangements which will improve safety by reducing conflict zones.

GTCC has expressed concern about unsafe and difficult bridge access over Candoormakh Creek on Wallanbah Road and have sought modification to the project to accommodate a new bridge. The proposal does not include an upgrade or replacement of the bridge over Candoormakh Creek. GTCC and the RTA have reached agreement that the bridge will be replaced by Council and funded jointly between GTCC and the RTA. Provision of the bridge will be subject to an independent environmental assessment and work program to the proposal.

Business and Economic

GTCC considers that the EIS inadequately addresses the social and economic impacts on Nabiac and its hinterland. GTCC and some other representations consider that the risks of the proposal for the community are considerable because it will experience the disadvantages of the upgrade (i.e. complex interchange, property devaluation, visual, noise, air quality impacts etc.), while not gaining any of the potential advantages (i.e. Highway traffic will not stop at Nabiac and prefer to use dedicated service centres). Council considers that the advantages of the proposal such as improved safety and travel times will predominantly be enjoyed by through traffic users of the Highway.

The proposal for the Highway upgrade has been developed in consideration of a number of factors including community expectations and improvements to safety and travel times. The proposal has a

number of impacts on the community, which could be viewed as either beneficial or adverse depending on the community group it affects.

Given the existing alignment of the Highway and the number of problematic and unsafe intersections, the proposed grade separation of local and regional traffic will provide significant community benefits by providing both a safer Highway route and safer local road Highway crossings.

The EIS states that 13% of the total annual turnover of Nabiac business establishments was generated from the Highway. A total of five businesses accounted for over 90% of Highway-related turnover. This reiterates the importance of Nabiac as a local service centre. The survey results also reiterated the importance of easy access to the village to maintain business viability, appropriate signage and maintaining (and enhancing) the attractiveness and ambience of Nabiac as a rural village.

While the majority of Nabiac business turnover is not generated by Highway users, it is considered important that the village is promoted as a convenient stopping point for Highway traffic. There is no dedicated highway service centre along the proposed route which enhances the potential of existing businesses within Nabiac to service Highway users. The Minister's Condition of Approval No. 32 requires the Proponent to develop in consultation with GTCC, GLC and the Community Liaison Group, signage and gateway treatments to attract through traffic into town.

The project would be a major element of infrastructure which would change the environment in the immediate vicinity. There would be potentially significant noise impacts on a number of properties. Section 5.4 of this report includes detailed construction and operational noise assessments relating to the project. Other amenity considerations relate to the treatment of interchanges, gateways, pedestrian underpasses and integration of landscaping with the surrounding environment. Urban design and landscaping are discussed in the following sections.

The Representations Report states that the layout for the Nabiac interchange has been driven by input from the community. Community preferences centred on restricting the movement of regional traffic from the west directly into the centre of the village and to position the overbridge as far south of the village as possible. It is a requirement of the Minister's Condition of Approval No. 34 that the Urban Design and Landscaping Report (discussed in the following section) consider minimising the footprint of the Nabiac overpass while integrating the batters into the adjoining landforms.

Council Issues

GTCC expressed concern that the Proposal would form a barrier to development on the western side of Nabiac. While the proposed upgrade has the potential to divide the eastern and western sides of Nabiac, the existing Highway already does this to some extent. The proposed improvements to road intersections and provision of an overpass will facilitate movement of traffic in a safer and more effective manner. These improvements have the potential to promote development on the western side rather than hinder it given that accessibility between both sides of the village will be improved.

Other issues raised by Council have been considered in this section and section 5.2.3.

Regional links

GTCC considers that the EIS does not address the issue of the location of the section of the Highway at the intersection of the major regional road MR90 (Wallanbah Road linking Nabiac to Gloucester), which connects the New England region to the coast at Nabiac.

The proposal provides for a major new grade separated junction at the intersection of MR90 with the Pacific Highway. The proposed improvements to the intersection will greatly improve road safety and accessibility for regional traffic movements and eliminate an existing traffic accident "black spot".

Property Acquisition

The EIS indicates that the proposal would directly impact on varying percentages of 55 properties. It is considered that the severity of land acquisition is fairly low given that the proposal utilises the majority of the existing route. In relation to agricultural impacts, the EIS states that the proposal would not impact on Class 1 or Class 2 agricultural land and much of the Class 3 land that would be impacted upon occurs on rural small holdings which are not reliant on the land for commercial agricultural purposes. The Representations Report concludes that the mitigation measures outlined in the EIS would ensure that the property impacts of the proposal are effectively managed.

The Department considers that property impacts during construction and operation of the proposal require careful consideration and management. Recommended Condition of Approval No. 28 requires that the Proponent ensures that property access is maintained throughout the construction period. The Proponent would also be required to consult with affected landowners on a regular basis regarding practical and cost-effective measures to minimise impacts prior to the commencement of construction. This requirement is reflected in Recommended Condition of Approval No. 26

5.3 Urban Design and Landscaping

5.3.1 Background

The landscape characteristics along the proposed route are described as follows:

- undulating cleared open forest mainly along the western side of the route;
- large tracts of forest woodland in areas of highest ecological value east of Minimbah Road and Brushgrove Park Road;
- modified pasture and grassland areas with views across low lying riparian vegetation around Wallamba River and Pipe Clay Creek;
- tall swamp forest adjacent to river and creek lines; and
- Nabiac town service centre with highly modified grassland with intermittent built elements, residential areas and commercial centre immediately adjacent to highway and along Nabiac Street.

The EIS indicates the visual sensitivity is generally low along the route although the area around the Wallamba River and the town centre to Wooster's Lane are identified as being of moderate visual sensitivity. Visual impact is considered moderate to high where the overpass and gateway treatments occur and where sound attenuation barriers are proposed.

The EIS concludes that the following mitigation measures would ameliorate the visual impacts associated with the proposal:

- soft landscaping enhancing existing character;
- sound barrier design enhancement; and
- dense screening in areas where residences adjoin the Highway.

The EIS also includes the following general principles for the proposal:

- retention and enhancement of local character;
- establishment of gateway treatments for Nabiac;
- crossings and linkages should be integrated into and complement the existing landscape;
- enhancement of road network through a hierarchy of road types;
- integration of cuttings and fill embankments into the landscape;
- enhancement of existing vegetation and provision of new plantings that relate to existing vegetation;
- water quality and runoff control measures should be designed so they are sympathetic to the surrounding landscape and fauna requirements;
- fauna protection fences are used in wildlife protection areas for fauna protection;
- noise mitigation measures; and
- signage, median treatments and lighting.

The Department commissioned Kiah Environmental Designers to undertake a peer review of the design aspects of the proposal as input into the Department's assessment. The Peer Review addresses the following issues and is provided as Appendix A to this report:

- components such as the overpass, associated ramps and supporting works in Nabiac and its vicinity;
- suitability and consistency of the design concept plan against the presented objectives of the EIS to avoid severance of the communities;
- assess the design concept plan with the local and regional context; and
- assess the adequacy of mitigation measures and safeguards.

The recommendations of the Kiah Environmental Designers Report are discussed below.

5.3.2 Key Issues Raised

Key issues raised in representations include:

- landscaping for noise mitigation supported;
- raised section of the Highway will have an adverse effect on the visual enjoyment of the surrounding rural scenery;
- need to enhance the acceptability of the Nabiac streetscape to locals and tourists;
- signage at gateways to town needed to encourage visitors;
- existing mature trees should be retained;
- landscape design strategy should be consistent with the Soil and Water Management Plan;
- need for public toilets at the end of the Village green car park or as part of Highway rest facility within or close to Nabiac;
- installation of suitable lighting systems needed at intersections;
- inconvenient location of pedestrian underpass and proximity to bus stops;
- pedestrian access to the overpass at Nabiac is required;

- issue of current design and the need to promote the visibility of the village to encourage Highway to use Nabiac; and
- visual impact of the extensive road works will present major city infrastructure in a rural environment.

5.3.3 Consideration of Key Issues

Road works footprint

A number of representations, including that from GTCC, expressed concern about the complexity and size of the proposed Nabiac interchange. Kiah's report considered that the footprint of the interchange appeared large and complex when compared to the size of the Nabiac village. However, after reviewing the traffic requirements and project brief it was considered that the footprint size is required. There may be an opportunity to reduce the roadwork footprint during detailed design. Recommended Condition of Approval No 35 requires that this issue is addressed in the preparation of the Urban Design and Landscaping Report.

Overpass design

The proposed overpass to the south of Nabiac has the potential to be a highly visible element within the landscape. The proposed landscape design in the vicinity of the ramps and overpass is generally supported in terms of the cultural landscape and indigenous species proposed. Kiah's report recommended that it may be more effective not to plant the fill batters completely, but to design more varying fill batters at varying slopes to better integrate with the surrounding landscape. Recommended Condition of Approval No. 35 requires the Proponent to consider this issue in the Urban Design and Landscaping Report. It is also recommended that an experienced urban designer is used to prepare the Urban Design and Landscaping Report.

Gateway treatments

Representations to the EIS, including that from GTCC, highlighted the importance of effective gateway treatments and signage as a mechanism to promote visitation to Nabiac from Highway users. While the general location and design principles of the gateways in the EIS are supported, the Kiah report recommends that a more integrated signage/gateway to mark the northern and southern entry to Nabiac is provided. This could be achieved by extending beyond the median treatment as is shown in details within the EIS for the northern gateway, use of signature trees, gateway features and plantings on either side of the Highway. Recommended Condition of Approval No. 32 requires the Proponent to develop signage and gateway treatments in consultation with GLC, GTCC and the CLG.

Significant trees

The EIS and Kiah's report identify a number of existing trees and groups of trees that contribute to the landscape setting of Nabiac and environs. These trees are also important for their ecological value and contribution to the town's setting. They include:

- three mature, visually significant Eucalypt trees in the vicinity of Candoormakh Crescent;
- Casuarina dominant vegetation along the creek north of Nabiac;
- a mature Eucalypt which marks the corner of Clarkson Street and the car park area (proposed to be removed);

- a group of trees south of Carefree Road, western edge of highway (some to be retained within a median); and
- a group of four pine trees and one poplar adjacent to the Nabiac Hotel (should be retained if possible).

It is recommended under Condition of Approval No 35 that the Urban Design and Landscaping Report consider the retention of these significant trees.

Pedestrian access

The proposal provides for a pedestrian underpass north of Wallanbah Road and Nabiac Street. Community feedback during the consultation process generally indicated a preference for a pedestrian underpass over an overpass due to visual impacts and access convenience. The Kiah report questioned the use of an underpass rather than an overpass in terms of safety considerations. Kiah also recommends that the access to the pedestrian underpass should be located closer to the Ampol service station for improved connectivity. This would also improve accessibility to regional bus stops on either side of the Highway. The Recommended Conditions of Approval No. 34 requires that the Proponent prepare an Urban Design and Landscaping Report that considers the location of the pedestrian underpass and improvements for accessibility and connectivity.

The design treatment of the proposed pedestrian underpasses is important for integration into the landscape, and for safety and utility. These requirements will need to be considered in the Urban Design and Landscaping Report as specified in Recommended Condition of Approval No 35.

Visual Impact

While the proposal utilises a large proportion of the existing corridor, there are a number of large sections on fill. It would be desirable to minimise these impacts through effective and sensitive earthworks that extend beyond the minimal batter requirements and integrate into the adjoining landforms. Planting design should also consider creating a variety of landscape patterns and spaces. Recommended Condition of Approval No. 35 requires the Proponent to consider these issues in the preparation of the Urban Design and Landscaping Report.

The Proponent would be required to monitor and maintain all landscaping works for a period of at least three years and, in the case of landscaping within the road reserve, for the life of the project. This requirement is specified in Recommended Condition of Approval No. 36.

5.4 Noise and Vibration

5.4.1 Background

An assessment of the noise and vibration impacts of the Project's construction and operation was undertaken. Steps in the assessment were:

- measurement of the existing noise environment;
- establishment of Project's operation and construction noise assessment goals;
- prediction and assessment of noise and vibration from construction activities;
- prediction and assessment of future traffic noise levels; and
- identification of methods available to mitigate operation and construction noise levels.

Construction Noise

The EIS indicates that construction activities would generate noise levels exceeding the construction noise goals at the nearest residences along the whole alignment. The EIS concludes that construction noise impacts would be mitigated by the preparation of a Construction Noise and Vibration Management Sub Plan which would consider:

- adherence to the EPA's recommended standard construction hours and further restricting working hours where noise impacts were likely;
- use of the quietest plant available;
- notification of residents prior to noisy or vibration-generating activities; and
- monitoring construction noise and vibration to ensure that best practice is implemented.

Operational Noise

The EIS indicates that existing ambient noise levels in the study area are characterised by road traffic noise and adopts the assessment criteria for the redevelopment of an existing freeway/arterial road which are:

- $L_{Aeq15\ hour}$ 60 dB(A) (7:00 am to 10:00 pm); and
- $L_{Aeq9\ hour}$ 55dB(A) (10:00 pm to 7:00 am).

These two criteria are referred to as the base criteria. Where existing traffic noise levels are already exceeded the road should be designed to increase existing noise levels by less than 2 dB(A). This is referred to as the allowance criterion.

The EIS concludes that traffic noise levels would exceed the base criteria and allowance criteria at 25 locations. Four of these locations would exceed the criteria by less than 2 dB(A) which was considered insignificant by the RTA. A range of mitigation measures were identified for all affected locations including noise barriers, treatment of individual dwellings (eg. double glazing) and noise reducing road surfaces.

The EIS concludes that final noise mitigation options would be developed during the detailed design. The actual mitigation measures to be implemented would be selected on the basis of practicality and cost effectiveness and following consultation with affected owners.

5.4.2 Key Issues Raised

The Environmental Protection Authority (EPA) raised the following:

- the accuracy of the modelling. The EPA stated that the accuracy of the modelling used was marginal;
- the assessment criteria for operational noise should be met at all residences including those identified as "marginally affected";
- an incorrect construction noise objective was identified in the EIS.

Issues raised by other representations included:

- traffic noise impacts from highway upgrade;
- specific noise impacts on local residences and need for noise mitigation measures;
- the accuracy of construction noise impacts outlined in EIS;

- lower the depth of roadway and use landscaping for local traffic noise mitigation;
- retention of existing mature trees for noise mitigation;
- installation of noise reduction devices prior to construction; and
- selection of a road surface that reduces noise impacts.

5.4.3 Additional Investigations

The Representations Report included an additional assessment of the operational road noise impacts generated by the Nabiac intersection/overpass of the Highway and also received at the caravan park to the north of Hardy Street. In both locations the additional assessment concluded that there were noise impacts additional to those identified in the EIS.

5.4.4 Consideration of Key Issues

Construction Noise

Given the likely construction noise goal exceedance, a precautionary approach to construction noise management is appropriate. The assessment included in the EIS was based on conceptual construction methodologies and would need to be re-evaluated before substantial construction. It is recommended that the Proponent prepare a detailed Construction Noise and Vibration Management Sub Plan. This Sub Plan, required by Recommended Condition of Approval No. 45, would detail proposed construction activities and processes (including noise impacts from ancillary facilities), assess the associated noise impacts and detail specific noise mitigation measures to be implemented.

The Department also recommends further mitigation measures be implemented by the RTA to control construction noise. These are contained in Recommended Condition of Approval No. 46 to 53 and include:

- identification of the construction noise objective;
- restrictions on working hours;
- consideration of the erection of operation noise mitigation measures prior to substantial construction (or at other times during construction); and
- vibration management.

Operation Noise

The EIS and Representations Report leave the selection of operation noise mitigation measures to the detail design phase. The Department recommends that an Operation Noise Management Report be prepared and submitted for the approval of the Director-General prior to substantial construction. The report would identify noise mitigation measures to be used and their method of evaluation. This analysis is required by Recommended Condition of Approval No. 58. In preparing the Report the Proponent must consult with the CLG and affected residents.

The Department's Recommended Condition of Approval No. 60 requires that the Proponent undertake operational noise monitoring to assess the adequacy of the implemented traffic noise mitigation measures. Should monitoring indicate a clear trend in traffic noise levels on the proposal higher than the criteria identified in the Operation Noise Management Report, the Proponent would be required to implement further mitigation measures in consultation with affected landowners.

6. CONSIDERATION OF OTHER ISSUES

This Section of the Report provides the Department's consideration of other environmental impacts of the Proposal based on an examination of the EIS, issues raised in representations made during the exhibition period and the Proponent's response to these issues presented in its Representations Report and during further consultation with the Department.

These issues are also addressed in the Proponent's Representations Report. That assessment was reviewed by the Department and, where required, further assessment undertaken. It is important that this Section and Section 5 be read in conjunction with the Representations Report to understand how all issues raised in representations were addressed.

6.1 Flora and Fauna

6.1.1 Background

The study area is a mixture of cleared and modified grazing land and remnant natural bushlands, including State Forests. Flora surveys for the study area revealed three areas of potentially significant flora habitat:

- remnant bushland south of Nabiac, between Glen Ora Road to south of Minimbah Road;
- riparian vegetation along the banks of the Wallamba River; and
- remnant bushland to the north of Nabiac, to the east of the Highway on either side of Brushgrove Park Road.

Further investigation of these areas was undertaken and found one plant species, *Asperula asthenes,* regarded as Threatened under the TSC Act. This species occurs along a tributary of Pipe Clay Creek to the north of Brushgrove Road. One other species of significance, *Eucalyptus robusta*, has also been found within the study area.

Fauna surveys of the study area identified the location of threatened fauna species in the vicinity of the preferred route. In accordance with the EP&A Act, the RTA prepared eight part tests which concluded that there would be no significant impact on threatened species, populations, or ecological communities or their habitats in the area. The RTA concluded that a species impact statement was not required.

The EIS recognised that the cumulative and ongoing loss of tree hollows is a major threat to a range of hollow-dependent threatened species. A targeted census of hollow-bearing trees was undertaken and 60 hollow containing trees were identified in the vicinity of the project. Of the 60 trees, 13 are within the proposed construction area and will require removal. A further 17 trees with hollows occur at the edge or fill or cut areas or would be isolated within the median.

6.1.2 Key issues raised in Representations

Key issues raised in representations were the:

- need for additional study into a number of species and threatening processes included under TSC Act since the EIS was prepared. There are similar species also listed under the EPBC Act since the EIS;
- impact on fauna and the need to reconsider the proposed fauna exclusion fencing;

- need to consider both aquatic flora and fauna and also the inclusion of riparian fauna underpasses in the design of waterway crossings;
- implications of the proposal on the flora and fauna habitats of the region;
- need to map the area's hollow bearing trees;
- monitoring programs, which were supported, but required further discussion with relevant agencies; and
- need to refine revegetation and landscaping plans.

6.1.3 Additional studies

NPWS required that consideration be made for the impacts of the project on the Grey-headed Flying Fox and the 10 new key threatening processes listed under Schedule 3 of the TSC Act. The Wildlife Branch of Environment Australia also suggested that the EIS be amended to include a number of EPBC Act listed migratory and threatened species.

The RTA prepared the additional studies and concluded that no adverse impacts would be encountered to the Grey-headed Flying Fox or the species listed under the EPBC Act. The studies also concluded that the project would not increase the threat posed by the ten processes.

The RTA also surveyed the location of hollow bearing trees within and adjoining the project footprint and committed to providing the NPWS with a copy of the survey.

6.1.4 Consideration of Key Issues

Loss of natural vegetation

The EIS identifies that approximately 4.16 ha of natural vegetation would be removed by the project's construction while approximately 1.53 ha of natural vegetation would be retained in the road median. The proposed loss of vegetation includes some vegetation communities considered of regional significance. The EIS concludes that this loss is not significant as the areas affected are currently roadside vegetation on the periphery of larger areas. The Department agrees with that conclusion.

Fauna and habitat

The NPWS raised specific concerns about the provision of fauna exclusion fencing. Recommended Condition of Approval No. 89 requires that the RTA consult with the NPWS to ensure that these concerns are considered in the detailed design.

The loss of tree hollows was identified as being of key importance in the viability of several threatened species. Thirteen hollow bearing trees would be removed for the upgrade with a loss of 40 specific hollow cavities. A range of compensatory measures were proposed for the loss of these hollow bearing trees including possible tree relocation (although that measure should be treated with caution because of the potential to cause additional damage in moving the trees) and establishment of artificial nesting boxes.

Waterway crossings

Both the NPWS and NSW Fisheries identified a need to consider aquatic and terrestrial flora and fauna in the design and construction of waterway crossings. Recommended Condition of Approval No. 69 requires that the RTA undertake the design and construction of bridges and culverts in consultation with these two agencies.

Monitoring programs

The project has a potential to indirectly affect a population of the threatened species *Asperula asthenes*. Recommended Condition of Approval No. 92 requires that the RTA monitor and protect the population and that these works be undertaken in consultation with the NPWS.

Revegetation and landscaping

The Representation from NPWS emphasised the need to use locally sourced native plants in the project's landscaping. NPWS also made several comments on the density of planting and species to be used. Recommended Condition of Approval No. 91 requires that the RTA prepare a flora and fauna management plan to manage flora and fauna impacts. This plan is to be prepared in consultation with the NPWS, DIPNR, NSW Fisheries and the two local councils. Further requirements for revegetation and landscaping are contained in Recommended Condition of Approval No. 94 to 96.

6.2 Soil and Water Management

6.2.1 Background

The Project is located in the Wallis Lake catchment which supports both high levels of aquatic production and also habitat for migratory and threatened species. The Project crosses three main waterways, the Wallamba River, Pipe Clay Creek and Candoormakh Creek, as well as a number of smaller unnamed creeks. A total of 51 drainage structures were identified for this section of Highway. To characterise local water quality a single water quality sampling was undertaken in four local waterways. Only limited parameters were analysed in this sampling.

Geological investigations concluded that:

- bedrock type were variations of siltstones and sandstones;
- soil types were predominately clays although alluvial soils were found on the floodplains of Wallamba River and Pipe Clay Creek;
- the soils were identified to have a high erodibility and low to moderate dispersion tendencies;
- Potential Acid Sulfate Soils were present on the southern side of the Wallamba River; and
- the project crossed a decommissioned landfill site located to the south of Glen Ora Road.

6.2.2 Issue Consideration

Key issues raised in the Representations were:

- To the west of the Project and in the catchment of Bundacree Creek is an aquifer which is proposed to be used as a drinking water source. The EIS does not mention the potential impact on this aquifer.
- A soil and water management plan must be prepared prior to works commencing and include erosion and sediment control plans.
- The design and implementation of proposed environmental control structures and techniques on site must reflect the identified erodibility and dispersion properties of the soils.

The Department generally endorses the RTA's proposed stormwater and water quality controls in the EIS. The Department notes that much of the detail of the soil and water management controls for both construction and operation would be determined during detailed design. As such, the Department recommends the inclusion of Recommended Condition of Approval No. 61 requiring the preparation of Soil and Water Quality Management Sub Plan as part of the CEMP. The Sub Plan is to be prepared in consultation with the EPA, DIPNR, NSW Fisheries, NPWS and the two local councils. In addition Recommended Condition of Approval No. 64 requires that the Proponent engage the DIPNR, or other appropriately qualified soil conservationist, to regularly advise on erosion and sediment controls during construction.

Specific Conditions of Approval are also recommended during construction to manage:

- works around the Wallamba River, including management of potential Acid Sulfate Soils (Condition 62 and 67);
- contaminated lands (Condition 73 and 74);
- alterations to flood patterns (Condition 68);
- groundwater (Condition 70).

Midcoast Water was concerned about the potential effects of spills on the drinking water aquifer. Recommended Condition of Approval No. 66 requires that the Proponent provide appropriate spill containment structures and that these be designed in consultation with the EPA and Midcoast Water.

6.3 Heritage

6.3.1 Indigenous Heritage

The EIS Indigenous Heritage study found no archaeological items in the study area and concluded that generally there was low or low to moderate potential for the area to contain sub-surface archaeological material. A site immediately to the north of the Wallamba River crossing was found to have some potential for archaeological materials. This was outside the project footprint.

The NPWS indicated satisfaction with the EIS indigenous heritage studies.

Recommended Condition of Approval No. 38, 43 and 44 specify management requirements for indigenous heritage.

6.3.2 Non-Indigenous Heritage

The EIS non-indigenous heritage study found that the project had a potential to affect two heritage items. Mitigation measures for these two items were identified in the detailed non-indigenous heritage study (Appendix K to the EIS). Recommended Condition of Approval No. 39 to 42 specify management requirements for non-indigenous heritage. These are consistent with those recommended in Appendix K.

The NSW Heritage indicated satisfaction with the indigenous heritage studies of the EIS Appendix.

6.4 Other Issues

6.4.1 Construction Traffic

The EIS contained little information about the generation of construction traffic or the quantities of earthworks and materials required for construction. The RTA indicated to the Department that significant quantities of material would need to be imported as the earthworks would be unbalanced cut and fill. Materials to be transported to site are pavement materials and general fill which the EIS suggested would be sourced from local suppliers. An approximate volume of 800,000 m^3 of material may need to be imported.

The Department notes that no representations raised the issue of construction traffic.

To ensure that construction traffic impacts on local roads and the community are minimised the Department recommends the inclusion of Condition of Approval No. 30 requiring the preparation of a Construction Traffic Management Sub Plan as part of the CEMP including a requirement to consult with the two local councils. Additionally, Recommended Condition of Approval No. 29 requires that road dilapidation reports be prepared to assess the damage caused by construction traffic on local roads. Where damage has occurred the Proponent is required to repair the damage at its cost.

6.4.2 Waste Management

The EIS states that the CEMP would detail the precise measures to manage, minimise and recycle waste.

The Department recommends the inclusion of Conditions of Approval requiring the preparation of a Spoil and Fill Management Sub Plan (Condition 71) and a Waste Management and Reuse Sub Plan (Condition 83) as part of the CEMP. These conditions are consistent with the RTA commitments.

6.4.3 Air Quality

The project has a potential to influence local air quality in two ways: dust generation during construction; and vehicle emissions during operation.

The Department recommends the inclusion of Condition of Approval No. 75 to 78 to manage air quality during construction. These conditions include a requirement to prepare a detailed Dust Management Sub Plan (Condition 75).

The EIS presented the results of air quality modelling during operation of the Project. The EPA queried the dates used in the modelling and requested that the air quality assessment be reviewed to ensure the output was consistent with the proposed Project opening dates. The RTA presented results of revised modelling in the Representations Report. The revised assessment was consistent with the conclusions presented in the EIS.

6.4.4 Greenhouse Gases

Greenhouse gasses are present in the atmosphere and work to trap warmth from the sun and maintain the earth's temperature. Increasing concentrations of these gases create the prospect of global warming. The NSW Government's greenhouse strategy identifies the transport sector as contributing approximately 17% of NSW's greenhouse gas emissions. The proposal would reduce emissions of

major greenhouse gases by about 145,736 tonnes over 30 years. The main features of the upgrade that have the potential to reduce greenhouse gas emissions, compared with the existing situation, include improved fuel consumption efficiency and the provision of a smoother road surface and alignment.

The Department recommends that the Proponent promote the reduction of greenhouse gas emissions by:

- minimising energy waste;
- training personnel in energy reduction techniques;
- conducting regular energy audits to identify and address energy wastage; and
- purchasing green energy for at least 50 per cent of the energy requirements of construction and operation of the proposal in accordance with the Recommended Condition of Approval No. 81.

7. CONCLUSIONS AND RECOMMENDATIONS

The State and Commonwealth Governments announced a joint *Pacific Highway Upgrading Program* to upgrade the Pacific Highway to deliver an improved road corridor. The benefit and justification of the overall upgrade lie in accident reduction, transport efficiency improvements and vehicle operating costs savings.

The proposal is part of the overall upgrading program and consists of the construction and operation of approximately 10 kilometres of dual carriageway on the Pacific Highway to the north and south of Nabiac, about 140 kilometres north of Newcastle. The proposal runs from Bundacree Creek south of Nabiac to Possums Brush north of Nabiac. It includes an overpass in the village to accommodate local traffic and a new bridge and footway over the Wallamba River for southbound traffic.

Thirty Two (32) representations were received in response to the public exhibition of the EIS. These were equally divided between government and business and individuals. Of the representations received, fourteen of the representations stated in principle support for the proposal while four objected, mainly because of the alignment through Nabiac. Key issues raised can be summarised to concern:

- urban design issues associated with a highway adjoining and passing through Nabiac;
- business and social concerns;
- noise impacts, principally operation noise;
- construction impacts; and
- ecological effects.

The Department believes that the proposed option is the best alternative of those considered. It provides the least overall impact based on consideration of a range of environmental, economic and social factors. The provision of urban design and landscaping measures and noise mitigation controls would help to minimise adverse impacts on residents.

The Department also recognises that the proposal has the potential to result in substantial benefits to the local community and wider population. At the local level the proposal would result in improved safety and amenity within Nabiac. More broadly the proposal would result in improved traffic efficiency and travel time savings on the Pacific Highway.

The Department has undertaken an assessment of the likely environmental impacts of the proposal. In particular it considered key issues associated with social and economic effects, urban design and landscaping, noise and vibration, flora and fauna, soil and water management and heritage. The Department's review concluded that, provided comprehensive mitigation measures are implemented, the adverse impacts of the proposal could be reduced to an acceptable level.

The Department recommends that the Proponent prepare comprehensive Environmental Management Plans for the construction and operational stages of the proposal. The Plans are to describe how the mitigation measures contained in the EIS, Representations Report and the Recommended Conditions of Approval are to be practically implemented.

The Department's assessment concludes that, provided the Recommended Conditions of Approval are adopted, the proposal could be approved by the Minister.

8. RECOMMENDED CONDITIONS OF APPROVAL

This Section provides the Department's recommended Conditions of Approval for the Project under section 115B(2) of the EP&A Act. The recommended conditions have been based on the Department's assessment of the EIS and representations Report, the Representations made to the EIS and further supplementary investigations, studies and advice.

It is noted that the EIS and Representations Report contain information on Sub Plans and mitigation strategies to be implemented as part of the proposal to address and manage residual impacts. The recommended conditions of approval shall therefore be implemented in conjunction with those Sub Plans and mitigation measures specified in the EIS and the Representations Report. Where there are any inconsistencies, the Conditions of Approval shall prevail.

The following acronyms and abbreviations are used in this section:

Conditions of Approval	The Minister's Conditions of Approval for the Project
Construction	Commencement of any physical works under this Approval
Department, the	Department of Infrastructure, Planning and Natural Resources
Director-General, the	Director-General of the Department of Infrastructure, Planning and Natural Resources or delegate
Director-General's Report	the report of the Director-General of the Department of Infrastructure, Planning and Natural Resources
EIS	The Bundacree Creek to Possum Brush Environmental Impact Statement Upgrade of the Pacific Highway 137.5km to 147.2km North of Newcastle prepared for the RTA by Sinclair Knight Merz, dated October 2001
Minister, the	Minister for Infrastructure and Planning
Project, the	The activity described in the EIS and Representations Report
Proponent	Roads and Traffic Authority
Publicly available	Easily accessed by a member of the general public (for example available on request at a display centre)
Reasonable and feasible	Consideration of best practice taking into account the benefit of proposed measures and their technological and associated operational application in the NSW/Australian context. 'Feasible' relates to engineering considerations and what is practical to build. 'Reasonable' relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits, cost of mitigation versus benefits provided, community views and nature and extent of potential improvements.
Relevant Councils	Great Lakes Council and Greater Taree City Council
Representations Report	The Bundacree Creek to Possum Brush Upgrade of Pacific Highway 137.5km to 147.2km North of Newcastle Representations Report' prepared by RTA Operations for the RTA, dated 25 November 2002
Sensitive Receiver	Residence, school, nursing home, hospital or similar
Structure	Any fixed artificial object including residences, farm sheds, fences, dams, cable support structures, etc.
Substantial Construction	Does not include survey, acquisitions, fencing, test drilling/test excavations, building/road dilapidation surveys, minor surveys, minor clearing except where endangered ecological communities or threatened flora or fauna species would be impacted, establishment of site compounds in generally cleared, highly disturbed or non environmentally sensitive areas, minor access roads, minor adjustments to services/utilities and other minimal environmental/community impact activities.

DIRECTOR-GENERAL'S APPROVAL

Where the Director-General's approval is required under any Minister's Condition of Approval the Director-General will endeavour to provide a response within one month of receiving the request for approval. The Director-General may request additional information if the request for approval is considered incomplete. In such cases, the time between the date on which the Proponent receives the request, and the date on which the additional information is provided to the Director-General, shall not be taken into account in the one month period.

DIRECTOR-GENERAL'S AGREEMENT

The phrase "agreed to by the Director-General" in these Conditions of Approval means provision of written advice from the Director-General.

ABBREVIATIONS

ARI	Average Recurrence Interval
ASS	Acid Sulfate Soils
CLG	Community Liaison Group(s)
CMS	Construction Method Statements
CEMP	Construction Environmental Management Plan
DIPNR	Department of Infrastructure, Planning and Natural Resources
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMR	Environmental Management Representative
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPA	Environment Protection Authority
GLC	Great Lakes Council
GTCC	Greater Taree City Council
L_{A90}	The noise level exceeded for 90% of a monitoring period, also referred to as the background noise level
$L_{Aeq\ 9hour}$	Equivalent continuous (constant) sound level over a 9 hour period from 10pm to 7am
$L_{Aeq\ (15\ hour)}$	Equivalent continuous (constant) sound level over a 15 hour period from 7am to 10pm
$L_{Aeq\ (15\ mins)}$	Equivalent sound pressure level over a 15 minute interval
$L_{A1(1\ minute)}$	Sound pressure level exceeded for 1 per cent of the time measured over a 1 minute interval
$L_{A10\ (15\ mins)}$	Sound pressure level exceeded for 10 per cent of the time over a 15 minute period
NPWS	National Parks and Wildlife Service
RTA	Roads and Traffic Authority

COMMENCEMENT, COMPLIANCE AND CONSULTATION

General

1. The Project must be carried out consistent with the:

   (a) Project contained in the EIS and the Representations Report;
   (b) procedures, safeguards and mitigation measures identified in the EIS and Representations Report;
   (c) Director-General's Report; and
   (d) Conditions of Approval granted by the Minister.

   The Conditions of Approval granted by the Minister prevail in the event of any inconsistency with the Project described in items (a) to (c).

2. The Conditions of Approval do not relieve the Proponent of the obligation to obtain all other approvals and licences required under any other Act. The Proponent must comply with the terms and conditions of such approvals and licences.

3. The Proponent must notify the Director-General and all relevant authorities in writing of both the Project's construction commencement (separately for "construction" and "substantial construction") and also the opening of the Project. Notification of all three steps must be provided at least four weeks before the relevant commencement date unless otherwise agreed to by the Director-General.

Compliance

General

4. It is the responsibility of the Proponent to ensure compliance with all Conditions of Approval granted by the Minister and to implement any measures arising from the Conditions of Approval.

5. The Proponent must bring to the attention of the Director-General any matter that may require further issuing of instructions from the Director-General. The Proponent must ensure that these instructions are implemented to the satisfaction of the Director-General within such time that the Director-General may specify.

6. The Proponent may elect to construct the Project in discrete work packages or defined stages. In that situation the Conditions of Approval may be complied with separately for each discrete work package or defined stage.

Pre-Substantial Construction Compliance Report

7. At least four weeks prior to commencement of substantial construction (or within any other time agreed to by the Director-General), the Proponent must submit a report detailing how all Conditions of Approval required to be addressed prior to substantial construction were complied with. Substantial construction of the Project must not commence until the Proponent has been advised in writing that the EMR has approved the Pre-Substantial Construction Compliance Report.

   The Pre-Substantial Construction Compliance Report must include:

(a) demonstration of how the following were addressed:
    (i) nomination and approval of the *Environmental Management Representative*;
    (ii) site surveying (assuming no clearance or site works are required);
    (iii) community consultation including copies of publications and media releases;
    (iv) EMP preparation;
    (v) communications with the Department and other relevant agencies; and
    (vi) compliance with relevant Conditions of Approval.
(b) a timeframe indicating when each of the conditions were complied with. This may include dates of submissions of the various studies and/or approval dates;
(c) conditions placed on any approvals or licences issued by other agencies and action taken (or proposed) to satisfy those conditions; and
(d) a plan indicating how the conditions which apply to the construction work package or defined stage will be satisfied.

Note:
If construction is undertaken in discrete stages then a Pre-Substantial Construction Compliance Report will need to be prepared in accordance with this condition for each discrete work package or defined stage.

Pre-Operation Compliance Report

8. At least four weeks (or within any other time agreed to by the Director-General) prior to commencement of operation of any part of the Project (or defined stages of the Project), the Proponent must submit a Pre-Operation Compliance Report for the approval of the EMR. This Report must detail how all Conditions of Approval that apply prior to commencement of operation were complied with. The report must include:

    (a) details demonstrating how each condition was satisfied during construction;
    (b) a timeframe indicating when each condition was complied with. This may include dates of submissions of the various studies and/or requirements of various relevant conditions, approval dates, completion of any necessary works etc;
    (c) summaries of major issues raised through the ongoing community consultation process and how these issues were addressed;
    (d) summaries of major environmental issues, how they were managed, and lessons learned;
    (e) conditions placed on any approvals or licences issued by other agencies and action taken (or proposed) to satisfy those conditions; and
    (f) a plan indicating how the conditions which apply during the operation stage will be satisfied.

Note:
This condition does not apply to temporary use of sections of the final Project during construction.

Dispute Resolution

9. The Proponent must endeavour to resolve any dispute between or with public authorities arising out of the implementation of these Conditions of Approval. Any matters which cannot be resolved must be referred firstly to the Chief Executives of the agencies involved. If the matter cannot be resolved at that level then it must be referred to the Minister for resolution. The Minister's resolution of the disagreement is final and binding on all parties.

COMMUNICATION AND CONSULTATION

Advertisement of Activities

10. Prior to the commencement of construction, and then at three monthly intervals, the Proponent must advertise in relevant local newspapers, the nature of the works proposed for the next three months, the areas in which these works are proposed, the construction hours and a contact telephone number.

    The Proponent must ensure that the local community and businesses are advised (by means such as newsletters, leaflets, newspaper advertisements, community notice boards, etc.) of the Project's progress. Information to be provided must include details of any traffic disruptions and controls, construction of temporary detours and work approved outside the normal construction hours, in particular noisy works, prior to such works being undertaken.

11. The Proponent must establish a Project internet site prior to the commencement of construction and maintain the internet site until 12 months after opening the Project to traffic. This internet site must contain monthly updates of work progress, consultation activities and a planned work schedule, including but not limited to:

    (a) a description of relevant approval authorities and their areas of responsibility;
    (b) a list of reports and plans that are publicly available under this Approval and the executive summaries of those reports;
    (c) minutes of community liaison group meetings;
    (d) contact names and phone numbers of the Project communications staff; and
    (e) the 24 hour toll-free complaints contact telephone number.

    Updates of work progress, construction activities and planned work schedules must be provided more frequently where significant changes in noise or traffic impacts are expected.

Community Liaison Group

12. A Community Liaison Group (CLG) must be formed and have its first meeting prior to the commencement of substantial construction. The CLG must be formed and operate in a manner consistent with the Guidelines provided in Attachment 1. It must include the EMR, representatives from the RTA and its contractor, relevant local community and business groups, GLC and GTCC unless otherwise agreed by the Director-General.

    Issues for discussion may include, but not be limited to, detailed design, the construction environmental management plan and associated sub plans, construction activities and any other issue considered relevant by the CLG.

    The CLG may make comments and recommendations about the design and implementation of the Project, which must be considered by the Proponent. In the event of any dispute between the CLG and the Proponent, the Proponent's decision shall be considered final so long as it is consistent with these Conditions of Approval.

Complaints Management System

13. The Proponent must implement a system (supported by adequate resources) prior to the commencement of construction which ensures all complaints received during construction are recorded and managed as expeditiously as possible. Minimum requirements for the Complaints Management System are that it include:

    (a) a 24 hour, toll free telephone number listed with a telephone company and advertised. This telephone number must enable any member of the public to reach a person who can arrange appropriate responses to the complaint(s) being made;
    (b) adequate resourcing including human resources, communication and transport etc.;
    (c) an appropriate person(s) to receive, log, track and respond to complaints within the specified timeframe. The name and contact details of the nominated person(s) must be provided to the relevant Council(s) and the Director-General upon appointment or upon any changes to that appointment;
    (d) details of all complaints received during construction are to be recorded and at least a verbal response on what action is proposed to be undertaken is required within two hours during any night-time works and 24 hours during standard hours or non-construction times;
    (e) a process for the provision of a more detailed response to the complainant within 10 days, if additional information exists (over and above that provided in the initial response);
    (f) appropriate management structures to allow effective resolution of complaints; and
    (g) a mediation system to ensure that all complaints are satisfactorily addressed to the greatest extent practicable. Where external or independent mediation is required, the mediator is to be approved by the Director-General.

    Information on all complaints received, including the means by which they were addressed and whether resolution was reached with or without mediation, must be included in the six-monthly Construction Compliance Report and must be made available to the Department on request.

ENVIRONMENTAL MANAGEMENT AND MONITORING

Environmental Management Representative

Appointment of EMR

14. Prior to the commencement of construction, the Director-General must approve the appointment of the person nominated by the Proponent to serve as the Environmental Management Representative (EMR). In considering the appointment, the Director-General will consider:

    (a) the qualifications and experience of the EMR including demonstration of general compliance with AS/NZS ISO 14012:1996 *Guidelines for Environmental Auditing : Qualification Criteria for Environmental Auditors*;
    (b) the role and responsibility of the EMR;
    (c) the authority and independence of the EMR including details of the Proponent's internal reporting structure; and
    (d) the time that the EMR will work on the Project. The EMR must be available on-site:
        (i) for sufficient time to undertake the EMR role. This timing shall be agreed between the Proponent and the EMR and advised to the Department in the request for EMR approval;
        (ii) at any other time requested by the Department; and

(iii) during any construction activities identified in the CEMP to require the EMR's attendance.

15. The Director-General may at anytime immediately cancel the approval of an EMR appointment by providing written notice to the Proponent. Interim arrangements for EMR responsibility following notice must be agreed in writing between the Department and the Proponent.

Responsibility

16. The EMR must have responsibility for:

(a) providing the written approvals identified in these Conditions of Approval. A copy of any written approval must be provided to the Department at the same time it is provided to the Proponent;
(b) providing to the Department a monthly register of complaints resulting from any activity approved by the EMR. Copies of complaints relating to noise and vibration issues must be forwarded to the Department immediately;
(c) considering and advising the Department and the Proponent on matters specified in the Conditions of Approval and compliance with such;
(d) certifying that the environmental impacts of all activities defined by the Proponent as not constituting substantial construction are minor;
(e) reviewing the Proponent's induction and training program for all construction personnel and monitoring its implementation;
(f) periodically monitoring the Proponent's environmental activities to evaluate the implementation, effectiveness and level of compliance of on-site construction activities with the CEMP, including carrying out site inspections at least fortnightly;
(g) recording and providing a written report to the Proponent of non-conformances with the CEMP requiring that the Proponent undertake mitigation measures to avoid or minimise any adverse impacts on the environment and/or report required changes to the CEMP;
(h) directing the Proponent to stop work immediately if, in the view of the EMR, an unacceptable impact on the environment is occurring or is likely to occur. The EMR may also require that the Proponent initiate reasonable actions, such as the authorisation of hold points, to avoid or minimise adverse impacts;
(i) reviewing corrective and preventative actions to ensure the implementation of recommendations made from audits and site inspections; and
(j) providing regular (as agreed with the Department) reports to the Department on matters relevant to the carrying out the EMR role including notifying the Director-General of any stop work notices.

The EMR must immediately, and at the same time, advise the Proponent and the Director-General of any major issues resulting from the construction of the Project that were not dealt with expediently or adequately by the Proponent.

Audit

17. The Department may at any time conduct an audit of any actions undertaken by the EMR and any approvals issued by the EMR. The Proponent:

(a) must facilitate and assist the Department in any such audit; and
(b) ensure that this requirement is included as a condition in the appointment of the EMR.

Environmental Management System

18. The Proponent must ensure the appointment of contractors that have a demonstrated capability and experience in the implementation of an Environmental Management System in accordance with NSW Government Policy.

Construction Environmental Management

Construction Staging

19. Where construction activities are to be undertaken in discrete work packages or defined stages, the Proponent may prepare individual construction EMPs for those work packages or stages. The Proponent must provide a schedule identifying the work packages or stages and their timing as part of the Pre-Substantial Construction Compliance Report.

Environmental Management Plan

20. A Construction Environmental Management Plan (CEMP) must be prepared prior to the commencement of substantial construction and following consultation with the EPA, DIPNR, NPWS, NSW Agriculture, NSW Fisheries, GLC and GTCC.

    The CEMP must be prepared in accordance with the Conditions of Approval, all relevant Acts and Regulations and accepted best practice management procedures. The CEMP must be approved in writing by the EMR prior to substantial construction commencing.

    The CEMP must:

    (a) address construction activities associated with all key construction sites, including staging and timing of the proposed works;
    (b) contain the Construction Sub Plans required by the Conditions of Approval;
    (c) cover any other relevant environmental elements identified by the Proponent, or its contractor, either from their environmental due diligence investigations or required to satisfy any other licence or approval;
    (d) include:
        (i) identification of the statutory and other obligations which the Proponent is required to fulfil during Project construction, including all approvals and consultations/agreements required from other authorities and stakeholders, and key legislation and policies which control the Project's construction;
        (ii) the role of the EMR;
        (iii) definition of the role, responsibility, authority and accountability for personnel relevant to the CEMP;
        (iv) measures to avoid and/or control environmental impacts;
        (v) identification of parameters to be monitored during construction which have the potential for cumulative effects;
        (vi) monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental management of the Project, including performance criteria, specific tests, protocols (eg. frequency and location) and procedures to follow;
        (vii) environmental management instructions for all complex environmental control processes which do not follow common practice or where the absence of such instructions could be potentially detrimental to the environment;

(viii) steps the Proponent intends to take to ensure that all plans and procedures are being complied with;
(ix) consultation requirements with relevant government agencies; and
(x) community consultation and notification strategy (including local community, relevant government agencies, GTCC and GLC), and complaint handling procedures.

The Proponent should note that there will be common issues requiring integration of some elements of the various Sub Plans contained in the CEMP.

The CEMP(s) must ensure that access is maintained to Nabiac village throughout the construction period.

The CEMP(s) must be made publicly available.

Construction Compliance Reports

21. The Proponent must submit to the Director-General Construction Compliance Reports detailing the environmental performance of the construction works and compliance with the CEMP and the Conditions of Approval. The Reports must be prepared six months after the start of substantial construction and then at six monthly intervals over the duration of the construction works or at any other time interval agreed to by the Director-General.

The Reports must be submitted no later than one month after the time period which they cover. The Reports must be certified by the EMR that all EMP requirements and Conditions of Approval were complied with or the EMR must identify the non-compliance.

The Reports must include information on:

a) applications for consents, licences and approvals, and responses from relevant authorities;
b) the implementation and effectiveness of environmental controls and conditions relating to the work undertaken;
c) identification of construction impact predictions made in the EIS and any supplementary studies and details of the extent to which actual impacts reflected the predictions;
d) details and analysis of results of environmental monitoring;
e) the number and details of any complaints, including a summary of main areas of complaint, action taken, response given and intended strategies to reduce complaints of a similar nature;
f) the plan to be adopted for the Project to ensure continued compliance over the coming six month period; and
g) any other matter relating to the compliance with the Conditions of Approval or as requested by the Director-General.

The Reports must be provided to the EPA, DIPNR, GLC and GTCC, and any other government agency nominated by the Director-General. The Reports must also be made publicly available.

Operational Maintenance and Monitoring

22. The Proponent must ensure that systems for operational maintenance and monitoring are in place prior to the opening of the project to traffic. Those systems must be subject to consultation with the EPA, DIPNR, GLC and GTCC and any other relevant government agency and approved by the EMR. The systems must be consistent with the Conditions of this Approval, all relevant Sub Plans,

all relevant Acts and Regulations and accepted best practice management.

The systems must address at least the following:

(a) identification of the statutory and other obligations which the Proponent is required to fulfil, including all licences/approvals and consultations/agreements required from authorities and other stakeholders, and key legislation and policies which control the Proponent's operation of the Project;
(b) identification of parameters to be monitored during operation of the Project which have the potential for cumulative effects to occur;
(c) monitoring, inspection and test plans for all activities and environmental qualities which are important to the environmental performance of the Project during its operation, including description of potential site impacts, performance criteria, specific tests and monitoring requirements, protocols (eg. frequency and location) and procedures to follow;
(d) steps the Proponent intends to take to ensure compliance with all plans and procedures. For example, in the event of a spill, how the Proponent shall ensure that all material spilled is removed as soon as practicable and within at least 24 hours;
(e) consultation requirements, including relevant government agencies, the local community and Councils, and complaints handling procedures; and
(f) strategies for managing the main environmental impacts including, but not limited to: noise; water quality; erosion and sedimentation; access and traffic; waste/resource management/removal/disposal; hydrology and flooding; visual screening; landscaping and rehabilitation; hazards and risks; and energy use, resource use and recycling.

Specific requirements for some of the main environmental system elements referred to in (f) must be as detailed under the Conditions of this approval and/or as required under any licence or approval. The arrangements must be publicly available.

Environmental Impact Audit Report - Construction

23. An Environmental Impact Audit Report - Construction must be prepared three months after the opening the Project to traffic and submitted to the Director-General. The Report must:

(a) identify the major environmental controls used during the Project's construction and assess their effectiveness;
(b) summarise the main management plans and processes implemented during the Project's construction within the context of the Pacific Highway Upgrading Programme and assess the effectiveness of the outcomes;
(c) identify any innovations in construction methodology used on the Project to improve environmental management; and
(d) discuss the lessons learnt during the Project, including recommendations for future RTA projects.

Environmental Impact Audit Report - Operation

24. An Environmental Impact Audit Report - Operation must be prepared 24 months after the opening of the Project to traffic and at any additional periods that the Director-General may require. The Report must be submitted to the Director-General and the EPA, and upon request by the Director-General, to any other relevant government authority within 24 months of the Project opening to traffic

An independent person must prepare the report at the Proponent's expense. The Report must assess the key operation impact predictions made in the EIS and any supplementary studies and detail the extent to which actual impacts reflect the predictions. The suitability of implemented mitigation measures and safeguards must also be assessed. The Report must also assess compliance with the systems for operational maintenance and monitoring.

The Report must discuss results of consultation with the local community particularly any feedback/complaints on the Project's operation and any issues of concern raised. The Proponent must comply with all reasonable requirements of the Director-General, EPA and other relevant authorities with respect to any reasonable measure arising from, or recommendations in, the Report.

The Report must be made publicly available.

SOCIAL AND ECONOMIC ISSUES

Property Damage and Access

Property Damage

25. Subject to landowner agreement, building condition surveys must be conducted on all structures within:

    (a) 200 metres of blasting;
    (b) 50 metres of construction activities that generate vibration impacts; or
    (c) any other locations as instructed by the EMR.

    Building condition surveys must be undertaken at least 30 days before construction occurs within the distance limits described in this condition.

    The owners of all properties for which building condition surveys are to be undertaken must be advised at least 14 days prior to the commencement of surveys of the scope and methodology of the survey and the process for making a property damage claim. A copy of the survey must be given to each affected owner at least three weeks prior to the commencement of construction in the section of road affecting the property. A register of all properties surveyed and considered for survey must be maintained by the Proponent and provided to the Director-General upon request.

26. The Proponent must consult on a regular basis with all directly affected landowners regarding any practical and cost-effective measures to minimise impacts. Agreed measures must be implemented according to a program agreed between the relevant landowner and the Proponent.

27. Any damage to structures, lawns or gardens caused by the Project's construction, direct or indirect (including vibration and groundwater changes) must be rectified at no cost to the owner(s).

    Where a licensed bore, dam or other property water supply is affected by the Project, the Proponent must reinstate water supplies of equivalent quality and quantity to affected landowners. Alternatively the Proponent may negotiate appropriate compensation for the loss with the landowner.

Access to Properties

28. The Proponent must ensure that access to properties is maintained throughout construction. The Proponent must ensure that any access-way affected by the Project is reinstated to an equivalent standard or that adequate compensation is negotiated with the relevant landowner(s).

Traffic and Access

29. Road dilapidation reports must be prepared for all roads (except the Pacific Highway) likely to be used by construction traffic prior to commencement of substantial construction and after construction is complete. Copies of the reports must be provided to GTCC and GLC. Any damage resulting from the construction of the Project, aside from that resulting from normal wear and tear, must be repaired at the cost of the Proponent.

    All sections of reclassified road for which GTCC or GLC become responsible must be brought to standards negotiated with GTCC and GLC. The Proponent must negotiate with GTCC and GLC regarding contributions to costs for maintenance.

> *Note:*
> *Nothing in this Condition shall be taken as restricting the Proponent from negotiating an alternative arrangement for damage to local roads with the relevant councils, subject to their agreement.*

30. The Proponent must prepare a Construction Traffic Management Sub Plan as part of the CEMP in consultation with GTCC and GLC. The Sub Plan must include:

    (a) identification of all public roads to be used by construction traffic, in particular roads used to transport of earthworks and pavement materials;
    (b) the timing and duration of the use of these roads;
    (c) impacts on existing traffic (including pedestrians, vehicles, cyclists and disabled persons) including the staging of construction works to minimise lane closures during peak periods and traffic delays;
    (d) access to construction sites;
    (e) truck ingress and egress routes, entry and exit locations and the nature of loads;
    (f) temporary and interim traffic arrangements including intersection and property access;
    (g) strategies to minimise construction heavy vehicles travelling through local roads in Nabiac;
    (h) a response plan for any construction traffic incident; and
    (i) appropriate review and amendment mechanisms.

31. The Proponent must monitor the use of local roads by construction heavy vehicle traffic in consultation with GTCC and GLC to develop measures to minimise and/or restrict use of local roads by heavy vehicle traffic as far as reasonable and practicable.

Business and Tourism

32. Prior to substantial construction (or as otherwise agreed to by the Director General) the Proponent must develop signage and gateway treatments in consultation with GTCC, GLC and the CLG including:

(a) gateway and integrated signage at Nabiac town entrance (Nabiac Street exit and overpass exit) to attract passing traffic into town; and
(b) reviewing the type and placement of signage to advise of the truck parking area.

33. No commercial advertising must be allowed within the road reserve during construction or operation except for directional purposes.

Urban Design and Landscaping

Pre-Construction

34. The Proponent must prepare an Urban Design and Landscape Plan prior to the commencement of construction in consultation with GTCC, GLC and the affected community. The Proponent must obtain the approval of the Director-General for the Plan prior to substantial construction or within any other time agreed to by the Director-General. The Plan must be prepared by a suitably qualified urban designer/landscape architect. The Plan must present an integrated urban design concept for the Project, applying all design principles established in the EIS and Representation Report. The Plan must identify the design and treatments for each element including:

(a) location and identification of existing and proposed vegetation;
(b) built elements including retaining walls, bridges and noise walls;
(c) underpasses considering lines of sight and the incorporation of appropriate lighting and public art;
(d) highway and road furniture including safety barriers, kerbs, paving, signage, medians, breakdown facilities and, if required, emergency phones;
(e) pedestrian and cycle elements including footpaths and paving, pedestrian crossings and fixtures (i.e. tree guards, seating, lighting, fencing and signage);
(f) landscape elements including proposed treatments, finishes and materials of exposed surfaces (including colour specifications and samples); and
(g) lighting.

The Plan must also include:

(h) sections and perspective sketches;
(i) a schedule of species to be used in landscaping that includes the use of locally native species and specifies target survival rates for plantings;
(j) details of the timing and progressive implementation of landscape works considering related environmental controls such as erosion and sedimentation controls and drainage;
(k) methods for monitoring and maintenance of landscaped areas;
(l) details of the decommissioning of construction stage structures that are not part of the operational Project;
(m) integration with the existing landscaping on the Village Green and the development of streetscape designs in the area bounded by Nabiac and Clarkson Streets and the Pacific Highway;
(n) provision for inter-regional bus stops on either side of the Highway in the vicinity of the Nabiac Street/Wallanbah Road and Pacific Highway intersection
(o) provision for the following pedestrian and cyclist links:

    (i) underpass crossing for pedestrians and cyclists at Hardys Road to allow access to and from the caravan park to Nabiac School;

(ii) underpass crossing for pedestrian and cyclists from Wallanbah Road to Nabiac Street; and
(iii) cycle path between Glen Ora Road and Nabiac township on eastern side of Highway;

35. The Urban Design and Landscaping Plan must also consider:

(a) minimising the footprint of the Nabiac overpass while integrating any batters into the adjoining landforms;
(b) reviewing the design of the water retention ponds at the overpass to create more informal organic shapes incorporating wetland filters;
(c) retaining the three mature, visually significant Eucalypts in the vicinity of Candoormakh Crescent;
(d) retaining the existing mature Eucalypt which marks the corner of Clarkson Street and the existing car park;
(e) retaining the group of trees south of Carefree Road, within the western side of the existing road reserve;
(f) the potential for dramatic views in the planting design, such as framing the view to Mount Talawahl from the northern carriageway;
(g) reinforcing the Casuarinas marking the Wallamba River and incorporating additional plantings towards Nabiac;
(h) retaining as much of the Casuarina dominant vegetation along Pipe Clay Creek as possible;
(i) retaining the group of four Pine trees and one Poplar adjacent to the Nabiac Hotel;
(j) review fill batters to incorporate varying slopes to better integrate with the surrounding landscape; and
(k) use of large evergreen or deciduous trees in the streets for Nabiac to create stronger streetscapes and shade trees; and
(l) reviewing the location of the proposed pedestrian underpass between Wallanbah Road and Nabiac Street to improve accessibility and connectivity.

Construction

36. All landscaping works must be monitored and maintained by a suitably qualified landscape specialist at the Proponent's expense for a period of not less than three years following completion of any landscaping stage. The Proponent must implement any required remedial measures to maintain landscaping works to a high standard. Any landscaping within the road reserve must be maintained by the Proponent for the life of the Project.

37. All lighting for the Project must be designed, installed and operated in accordance with the requirements of AS1158 *Road Lighting* and AS4282 *Control of the Obtrusive Effects of Outdoor Lighting*.

HERITAGE

Indigenous Heritage Management Sub Plan

38. As part of the CEMP the Proponent must prepare an Indigenous Heritage Management Sub Plan, in consultation with the Forster Local Aboriginal Land Council and NPWS. This Sub Plan must include:

(a) details of the archaeological investigations to be undertaken;

(b) details of any licences and approvals required including any management or salvage requirements;
(c) procedures to implement if previously unidentified items/areas are located during construction; and
(d) an education program for all personnel on obligations with regard to Aboriginal cultural materials.

Non-indigenous Heritage Management

Failford Cemetary

39. The Proponent must ensure that the trees along the southern boundary of the Failford cemetery are retained to provide a visual screen from the Pacific Highway and to maintain the current setting.

40. The Proponent must ensure that access to the Failford cemetery from the Highway is maintained. The unsealed access track along the western boundary must be retained.

Wooster's Residence and Butchers Shop

41. The Proponent must prepare a Report on the Non-Indigenous Heritage Survey of Wooster's residence and butchers shop in consultation with GTCC prior to the commencement of substantial construction. The Report must include:

    (a) an archival photographic record in colour, monochrome print and colour transparency prepared in accordance with the Department and Heritage Office guidelines *How to Prepare Archival Records of Heritage Items* and *Photographic Records of Heritage Sites, Buildings and Structures*;
    (b) measured drawings of the exterior of the shop and layout of internal fittings; and
    (c) a history of the use of the shop with reference to family records, photographs and oral history.

    Copies of the Report must be forwarded to the Heritage Office, GTCC, Local Historical Society, local libraries and the Wooster family.

42. The Proponent in consultation with GTCC, the Local Historical Society and the Heritage Office must consider the feasibility of relocating Wooster's residence and butcher's shop.

Test Excavation Works

43. If the development is to affect the cleared pasture area, outside the road reserve, on the north-east side of the Wallamba River crossing, the Proponent must engage a qualified archaeologist to undertake test excavations in consultation with the Forster Local Aboriginal Land Council and NPWS, prior to the commencement of construction. The Proponent must ensure that these works are carried out in accordance with a permit obtained under Section 87 of the *National Parks and Wildlife Act 1974*.

Unexpected Items

44. If during the course of construction the Proponent becomes aware of any heritage items or archaeological material, all work likely to affect the site(s) must cease immediately and relevant

government agencies and the relevant Local Aboriginal Land Council, must be consulted to determine an appropriate course of action prior to the recommencement of work at that site.

NOISE AND VIBRATION

Construction Noise and Vibration Management Sub Plan

45. The Proponent must prepare a detailed Construction Noise and Vibration Management Sub Plan as part of the CEMP. The Sub Plan must be prepared prior to substantial construction and in consultation with the EPA, GLC, GTCC and the CLG. The Sub Plan must include:

(a) identification of each work area, site compound and construction depot;
(b) identification of the specific activities that will be carried out and associated noise sources for each work area, site compound and construction depot;
(c) identification of all potentially affected noise sensitive receivers including residences, schools, commercial premises and noise sensitive equipment;
(d) the construction noise objective for the Project specified in the Conditions of Approval;
(e) the construction vibration criteria for the Project specified in the Conditions of Approval;
(f) determination of appropriate noise and vibration objectives for each identified noise sensitive receiver, excluding residential development;
(g) noise and vibration monitoring, reporting and response procedures;
(h) assessment of potential noise and vibration from the proposed construction methods including noise from construction vehicles and noise impacts from required traffic diversions;
(i) detailed examination of feasible noise mitigation measures including;
    - maximising the offset distance between noisy plant items and noise sensitive receivers;
    - avoiding using noisy plant simultaneously and/or close together, adjacent to sensitive receivers;
    - orienting equipment away from sensitive receivers;
    - carrying out loading and unloading away from sensitive receivers;
    - use of dampened tips on rock breakers;
    - use of portable enclosures around mobile and fixed plant where noise impacts are likely to be unacceptable;
    - using noise source controls, such as the use of residential class mufflers, to reduce noise from all plant and equipment including bulldozers, cranes, graders, excavators and trucks. Examples of appropriate noise source controls are provided in Section 5 of the *RTA Environmental Noise Management Manual*;
    - selection of plant and equipment based on noise emission levels;
    - use of alternative construction methods;
    - alternative arrangements with affected residents such as temporary relocation;
    - selecting site access points and roads as far as possible away from sensitive receivers; and
    - use of spotters, Closed Circuit Television Monitors and 'smart' reversing alarms in place of traditional reversing alarms.
(j) description of management methods and procedures that will be implemented to control noise and vibration during construction;
(k) justification for any activities outside the construction hours specified in the Conditions of Approval;
(l) description of the approval process to be followed where construction is required outside the construction hours specified in the Conditions of Approval for traffic management reasons;
(m) construction timetabling, in particular for works outside standard hours, to minimise noise

impacts including time and duration restrictions, respite periods, and frequency;
(n) internal noise audit systems including recording of daily hours of construction, progressive impact assessments as the work proceeds and site inspections by the EMR;
(o) procedures for notifying residents of construction activities that are likely to affect their noise and vibration amenity;
(p) contingency plans to be implemented in the event of non-compliances and/or noise complaints; and
(q) education of construction personnel about noise minimisation.

The Proponent must ensure that the mitigation measures referred to in the EIS, Representations Report and in these Conditions are incorporated into the Sub Plan.

Construction Hours

46. Construction activity must be restricted to between the hours of 7:00 am to 6:00 pm (Monday to Friday), 8:00 am to 1:00 pm (Saturday) and at no time on Sundays and public holidays.

Works may be undertaken outside these hours where:

(a) the works are not audible at any sensitive receiver;
(b) the delivery of materials is required outside these hours by the Police or other authorities for safety reasons;
(c) it is required in an emergency to avoid the loss of lives, property and/or to prevent environmental harm; or
(d) the work is approved through the Construction Noise and Vibration Management Sub Plan.

Local residents must be informed of the timing and duration of work approved under item (d) at least 48 hours prior to commencement of that work.

Construction Noise Objective

47. The construction noise objective for the Project is to manage noise from construction activities (as measured by a $L_{A10\ (15minute)}$ descriptor) to not exceed the background L_{A90} noise level by more than 5dB(A) at any residence or other noise sensitive receiver. Background noise levels are those identified in the EIS or Representations Report or otherwise identified in the Construction Noise and Vibration Management Sub Plan. The Proponent must implement all feasible noise mitigation and management measures with the aim of achieving the construction noise objective.

Any potential activities that may cause noise emissions that exceed the objective must be identified and managed in accordance with the Construction Noise and Vibration Management Sub Plan.

If the noise from a construction activity is substantially tonal or impulsive in nature (as described in Chapter 4 of the *NSW Industrial Noise Policy),* 5dB(A) must be added to the measured construction noise level when comparing the measured noise with the construction noise objective.

Construction Noise Management

48. The Proponent must ensure that no public address systems are used at any construction site outside the construction hours detailed in the Conditions of Approval unless otherwise specified in the Construction Noise and Vibration Management Sub Plan. Any public address system must be

designed to minimise noise spillage off-site by incorporating best practice features and equipment such as directional speakers, volume control with background noise adjustments and locating and pointing speakers away from sensitive receivers.

49. The Proponent must schedule rock breaking, rock hammering, sheet piling, pile driving and any similar activity only between the following hours unless otherwise approved in the Construction Noise and Vibration Management Sub Plan:

    (a) 9 am to 3 pm, Monday to Friday; and
    (b) 9 am to 12 pm, Saturday

    Where activities are undertaken for a continuous three hour period and are audible to noise sensitive receptors, a minimum respite period of at least one hour shall be scheduled before activities recommence.

50. The Proponent must ensure that wherever practical, and where sensitive receivers may be affected, piling activities are completed using bored piles. If driven piles are required they must only be installed where approved in the Construction Noise and Vibration Management Sub Plan.

51. The Proponent must ensure there is no queuing of construction vehicles on public roads unless approved in the Construction Noise and Vibration Sub Plan.

52. The Proponent must consult with GTCC, GLC and affected landowners and, where reasonable and feasible, erect operation noise mitigation measures at the start of substantial construction (or at other times during construction) to minimise construction noise impacts.

53. The Proponent must consult with education institutions and minimise the impact of noise generating construction works in their vicinity. The Proponent must ensure that construction works audible at an institution are not timetabled during important events, such as examination periods, unless arrangements acceptable to the affected institutions are made at no cost to the affected institutions.

Vibration Criteria

54. Vibration caused by construction at any residence or structure outside the Project boundaries must be limited to:

    (a) for structural damage vibration, German Standard DIN 4150 Part 3 *Structural Vibration in Buildings. Effects on Structures*; and
    (b) for human exposure to vibration, the evaluation criteria presented in British Standard BS 6472-*Guide to Evaluate Human Exposure to Vibration in Buildings* (1Hz to 80 Hz) for low probability of adverse comment.

    These limits apply unless otherwise approved in the Construction Noise and Vibration Management Sub Plan.

Vibration Management

55. Vibratory compactors must not be used closer than 30 metres from residential buildings unless vibration monitoring confirms compliance with the vibration criteria of the Conditions of Approval.

Operation Noise Management

Operational Noise Criteria

56. The sound pressure level due to road traffic noise emissions when measured one metre from the façade of a residential building or any other noise sensitive premises must be designed to meet the operational noise criteria for redevelopment of an existing arterial road. These are:

    (a) $L_{Aeq15\ hour}$ 60 dB(A) (7:00 am to 10:00 pm); and
    (b) $L_{Aeq9\ hour}$ 55 dB(A) (10:00 pm to 7:00 am).

    These criteria must apply unless otherwise identified in the Operation Noise Management Report.

57. The Proponent must provide noise treatments for all existing noise sensitive vacant land adjacent to the Project and which is zoned for noise sensitive development in accordance with Practice Note (ii) of the RTA's Environmental Noise Management Manual.

Noise Management Report

58. The Proponent must prepare an Operation Noise Management Report detailing its investigation of reasonable and feasible operation noise mitigation methods. The Proponent must obtain the approval of the Director-General for the Report prior to substantial construction commencing or within any other time agreed to by the Director-General. The report and investigation must be conducted in accordance with the NSW Government's *Environmental Criteria for Road Traffic Noise* and the RTA's *Environmental Noise Management Manual*. The report and investigation must include:

    (a) identification of operation noise criteria in accordance with the Conditions of Approval;
    (b) predictions of noise levels at all affected residential, recreational, commercial and industrial land uses;
    (c) the location, type and timing of erection of permanent noise barriers and/or other noise mitigation measures (including road surface)demonstrating best practice;
    (d) details of specific physical and managerial measures for controlling noise;
    (e) details of reasonable and feasible noise mitigation measures. To assist in the decision of reasonable and feasible noise mitigation options for road traffic noise a Barrier Sensitivity Analysis must be conducted and presented in the report in accordance with Practice Note IV of the RTA Environmental Noise Management Manual for the entire Project. The importance applied to aesthetic impacts (visual, shadowing etc.) and noise mitigation along the Project must be determined in consultation with the CLG and affected residents. Consideration should be given to the inclusion of clear panels within noise barriers to reduce visual and overshadowing impacts;
    (f) the urban design issues relating to noise control measures; and
    (g) details of noise monitoring, reporting and response procedures including monitoring on Clarkson Street and Abbott Street.

59. The Proponent must install all reasonable and feasible noise mitigation measures as identified in Condition 58 to the satisfaction of the Director-General. Mitigation must be designed and implemented in consultation with affected landowners.

Operational Noise Monitoring

60. Monitoring of operation noise must be undertaken in accordance with Practice Note VIII of the RTA's *Environmental Noise Management Manual*. The Proponent must, in consultation with the Director General, assess the adequacy of the traffic noise mitigation measures at a time between six months and one year of opening the Project. The assessment must consider the operation noise criteria specified in the Conditions of Approval and the Operation Noise Management Report. Should the assessment indicate traffic noise levels exceeding those predicted in the Operation Noise Management Report, the Proponent must investigate and implement further reasonable and feasible mitigation measures in accordance with the NSW Government's *Environmental Criteria for Road Traffic Noise* and RTA's *Environmental Noise Management Manual*. The selection of these measures must be undertaken in consultation with affected landowners and/or occupiers and be consistent with the Operation Noise Management Report.

PHYSICAL ISSUES

Soil and Water Management

Soil and Water Quality Management Sub Plan(s)

61. As part of the Construction EMP, the Proponent must prepare a Soil and Water Management Sub Plan in consultation with the EPA, DIPNR, NSW Fisheries, NPWS, GTCC and GLC. The Sub Plan must be prepared in accordance with the Department of Housing's guideline *Managing Urban Stormwater - Soils and Construction*, the RTA's *Guidelines for the Control of Erosion and Sedimentation in Roadworks* and, where appropriate, DIPNR's *Constructed Wetlands Manual*. The Soil and Water Quality Management Sub Plan must include:

    (a) management of the cumulative impacts of the development on the quality and quantity of surface and groundwaters, including stormwater in storage, sedimentation dams and flooding impacts;
    (b) a catchment analysis to determine the capacity of existing drainage systems and changes resulting from the construction of the Project including detention requirements;
    (c) site specific erosion and sediment control plans providing details of short and long-term measures to be employed to minimise soil erosion and the discharge of sediment to land and/or waters including the location and capacity of sedimentation basins;
    (d) a strategy to manage the extent of exposed ground surface during construction and progressive site rehabilitation requirements;
    (e) management of the impacts of the development on creeks and water bodies, in particular Wallamba River, Pipe Clay Creek and Candoormakh Creek;
    (f) identification of all potential sources of water pollution and a detailed description of the remedial action to be taken or management systems to be implemented to minimise emissions of these pollutants from all sources within the Project;
    (g) detailed description of water quality monitoring to be undertaken during the pre-construction, construction and operation stages of the Project including identification of monitoring locations;
    (h) schedule of inspections by DIPNR, or other appropriately qualified soil conservationist in accordance with the requirements of Condition 64;
    (i) contingency plans to be implemented in the event of fuel spills or turbid water discharge from the site; and
    (j) a program for reporting on the effectiveness of the sediment and erosion control system against performance goals.

The Soil and Water Management Sub Plan must clearly show how the mitigation measures identified in the EIS and Representations Report will be implemented during construction.

Construction

62. The Construction Soil and Water Management Sub Plan must include a specific Construction Method Statement for works around the Wallamba River. The Statement must include details of the following measures:

    (a) diversion of surface runoff to sedimentation basins;
    (b) use of a silt curtain or similar containment device for both the bored pile and driven pile technique;
    (c) management of concrete use in and adjoining the river; and
    (d) relationship of the bridge construction with the Acid Sulphate Soils Management Sub Plan.

63. Construction stage water quality structures must be maintained for a minimum of six months after commissioning of the Project or until revegetation has provided groundcover to at least 70% of the exposed ground surface controlled by the structure.

64. The DIPNR, or other appropriately qualified soil conservationist, must be consulted in accordance with a schedule developed in the Construction Soil and Water Management Sub Plan to:

    (a) undertake inspections of temporary and permanent erosion and sedimentation control devices;
    (b) ensure that the most appropriate controls are being implemented;
    (c) check that controls are being maintained in an efficient condition; and
    (d) check that controls meet the requirements of any relevant approval/licence condition(s).

    The results of these inspections and any follow-up actions must be reported in the Construction Compliance Reports required by the Conditions of Approval.

Operation

65. All stormwater drainage, erosion, sedimentation and water pollution control systems and facilities of the Project must be located, designed, constructed, operated and maintained to meet the requirements of the EPA, DIPNR, Midcoast Water, GLC and GTCC. All facilities including wetland filters, grass filter strips, gross pollutant traps and sedimentation basins must be inspected regularly and maintained in a functional condition for the life of the Project.

66. The Proponent must provide appropriate detention systems for containment of spills and materials arising from accidents that are consistent with the RTA's "*Code of Practice for Water Management – Road Development and Management*" in consultation with the EPA and Midcoast Water.

Acid Sulfate Soils Management

67. As part of the CEMP the Proponent must prepare an Acid Sulfate Soil Management Sub Plan in consultation with all relevant government agencies. The Sub Plan must:

    (a) be prepared in accordance with the *Acid Sulfate Soils Manual* (ASSMC, 1998);

(b) include a Contingency Plan to deal with the unexpected discovery of actual or potential acid sulphate soils; and
(c) include reference to the water quality monitoring program contained in the Soil and Water Quality Management Sub Plan.

Hydrology and Flooding

Inundation levels

68. The Project must be designed to "not worsen" the existing flooding characteristics in any waterway upstream or downstream of the Project elements unless otherwise agreed with affected landholders and in consultation with DIPNR, GLC and GTCC. "Not worsen" shall be defined as:

(a) a maximum increase in inundation levels upstream of the Project of 50 mm in a 1 in 100 year ARI rainfall event; and
(b) a maximum increase in inundation time of one hour for any rainfall event.

Bridge and Culvert Design

69. The Proponent must consult the NPWS and NSW Fisheries about the design of bridge and culvert construction. In undertaking bridge design and construction, the Proponent must ensure that: no earthen platforms for driving piles are constructed and all embankments are located away from the edge of waterways unless otherwise agreed by NSW Fisheries. The Proponent must also investigate in consultation with NPWS, designing bridge structures that are suitable for fauna use.

In undertaking culvert design and construction, the Proponent must ensure that there is no drop or 'waterfall' effect at the end of the structure and the base of the culvert is set into (rather than on) the floodplain so that natural sediments are allowed to cover the bottom, providing a less alien habitat for fish passage and that a 'low flow channel' is provided in the main flow cell of a box culvert to facilitate fish passage during periods of low flow, in important fish streams.

Groundwater

70. Prior to any major earthworks, the Proponent must investigate the potential for changes in the groundwater table. Where a potential for change is identified the Proponent must develop measures to safeguard and/or mitigate impacts and procedures to monitor changes. The proposed monitoring program must be prepared prior to the commencement of any construction activities which could potentially affect groundwater and must be developed in consultation with the DIPNR.

Spoil and Fill Management

71. As part of the CEMP the Proponent must prepare a Spoil and Fill Management Sub Plan. The Sub Plan must include:

(a) details of the volumes of fill required in relation to staging of the Project;
(b) how spoil and fill material will be sought, handled, stockpiled, reused and disposed; and
(c) details of reuse/disposal sites and the volumes of spoil to be transported to each site.

The Spoil and Fill Management Sub Plan must be integrated with other relevant Sub Plans.

72. All material excavated from the works must be reused or recycled where suitable and if cost-effective to do so. The Proponent must ensure that the reuse of material generated from construction activities is maximised in preference to importing fill.

Contaminated Land

73. A Contamination Investigation Report must be prepared in consultation with the EPA, GLC and GTCC to determine the nature, extent and degree of any contamination along the road corridor, in particular at the landfill site. The Report must be prepared in accordance with the EPA Guideline *Environmental Guidelines: Assessment, Classification and Management of Liquid and Non-Liquid Wastes*. As part of the Report the Proponent must prepare a contingency plan to be implemented in the case of unanticipated discovery of contaminated material during construction.

Air Quality

Dust Management Sub Plan

74. A detailed Dust Management Sub Plan must be prepared as part of the CEMP. The Sub Plan must provide details of all dust control measures to be implemented during the construction stage, including:

    (a) identification of potential sources of dust;
    (b) dust management objectives in accordance with appropriate EPA guidelines;
    (c) a monitoring program to assess compliance (by sampling and obtaining results by analysis) in accordance with Table 1;
    (d) details of mitigation measures to be implemented during periods of extreme climatic conditions where high level dust episodes are likely to occur;
    (e) a reactive dust management procedure detailing how and when operations are to be modified to minimise the potential for dust emissions, should emission levels exceed the criteria; and
    (f) a progressive revegetation strategy for exposed surfaces with the aim of minimising exposed surfaces.

Table 1 – Ambient Dust Monitoring

Pollutant	Units of Measure	Frequency	Method[1]
Dust deposition rate	g/m^2/month	Continuous	AM-19
Siting	-	-	AM-1

[1] – NSW EPA, 2001, Approved Methods for Sampling and Analysis of Air Pollutants in New South Wales

Construction

75. Construction vehicles using public roads must be managed to prevent any loss of load, whether in the form of dust, liquid or soils. Construction vehicles must be maintained and wheel wash facilities or equivalent must be constructed at exit points of all unsealed construction sites/compounds to minimise tracking any mud, dirt or other material onto any street which is opened and accessible to the public. In the event of any spillage, the Proponent must remove the spilt material within 24 hours.

76. The Proponent must ensure that all plant and equipment at the site, or used in connection with the proposal, are:

    (a) maintained in a proper and efficient condition; and
    (b) operated in a proper and efficient manner.

77. The Proponent must ensure that any air pollution (dust or vehicle emissions) generated by the construction is assessed in accordance with the requirements of the Dust Management Plan and that activities are relocated, modified, and/or stopped as required to minimise air quality impacts occurring and to ensure that the safety of motorists using the surrounding public roads is not compromised.

Greenhouse Gases

Construction Stage

78. The Proponent must promote the reduction of greenhouse gases by adopting energy efficient work practices including:

    (a) developing and implementing procedures to minimise energy waste;
    (b) conducting awareness programs as part of induction for all site personnel regarding energy conservation methods; and
    (c) conducting regular energy audits during the Project to identify and address energy wastage.

79. Construction Compliance Reports required by the Conditions of Approval must include confirmation that no rainforest timbers are used in any construction activities.

Sustainable Energy

80. Construction Compliance Reports required by the Conditions of Approval must include confirmation that, where available from the local supply authority, green power is purchased for the supply of at least 50% of the electrical energy requirements for the Project's construction.

Hazards and Risk Management

81. As part of the Construction EMP and operating systems, the Proponent must prepare and implement a Hazards and Risk Management Sub Plan. These Sub Plans must include:

    (a) details of the hazards and risks associated with the Project; and
    (b) pro-active and reactive mitigation measures including contingency plans to be implemented in the event of a pollution incident.

Waste Management and Recycling

82. As part of the Construction EMP the Proponent must prepare a Waste Management and Reuse Sub Plan. The Sub Plan must address the management of wastes during construction in accordance with Government's *Waste Reduction and Purchasing Policy*. The Sub Plan must identify requirements for:

(a) the application of the waste minimisation hierarchy principles of avoid-reduce-reuse-recycle-dispose;
(b) waste handling and storage;
(c) disposal of wastes: specifically contaminated soil or water, concrete, demolition material, cleared vegetation, oils, grease, lubricants, sanitary wastes, timber, glass, metal, etc.;
(d) implementation of energy conservation best practice; and
(e) identifying any site for final disposal of any material and any remedial works required at the disposal site before accepting the material.

83. Any waste material that is unable to be reused, reprocessed or recycled must be disposed at a landfill licensed by the EPA to receive that type of waste.

Utilities and Services

84. The Proponent must identify the utilities and services (hereafter "services") potentially affected by construction activities to determine requirements for diversion, protection and/or support. Alterations to services must be determined by negotiation between the Proponent and the service providers. The Proponent in consultation with service providers must ensure that disruption to services resulting from the Project are minimised and advised to customers.

Location of Construction Facilities

85. The location of construction compounds and ancillary facilities such as concrete batching plants must satisfy the following criteria unless otherwise approved in the CEMP:

(a) sites to be located within the road corridor and ancillary sites assessed in the EIS and Representations Report;
(b) sites to be located with ready access to the local road network;
(c) sites to be located to minimise the need for heavy vehicles to travel through Nabiac;
(d) sites on relatively level land;
(e) sites to be separated from nearest residences by at least 200 m;
(f) sites are not to be permitted within 100 m of, or drain directly to, SEPP 14 wetlands;
(g) sites are not to be located within 100 m of waterways unless adequate erosion and sediment controls are implemented to protect water quality;
(h) sites must be above the 20 ARI flood level unless a contingency plan to manage flooding issues is prepared and implemented;
(i) sites are to have low conservation significance for flora, fauna or heritage and are not to require any additional clearing of native vegetation beyond that required for the Project in any case; and
(j) sites are to be selected so that the operation of the plant does not impact on the land use of adjacent properties.

The location of any concrete batching plants or construction compounds must be detailed in the CEMP and must include an assessment against the above criteria.

86. The site compound area on the western side of the proposed Highway alignment adjacent to Nabiac village, must not be used for a concrete batching plant or stockpile area.

FLORA AND FAUNA

Pre-Construction

87. The Proponent must consult the NPWS prior to the commencement of construction about the locations of fauna exclusion fencing.

88. The Proponent must develop and implement a monitoring program for the threatened species *Asperula asthenes* in consultation with the NPWS and affected landowners. The program must measure the Project's effects on the population of this species in the vicinity of Brushgrove Park Road. The agreement of affected landowners must be obtained where access is required onto private property.

Construction

89. As part of the CEMP, the Proponent must prepare a Flora and Fauna Management Sub Plan in consultation with the NPWS, DIPNR, NSW Fisheries, GTCC and GLC. The Sub Plan must manage all impacts on flora and fauna in the vicinity of the Project and include:

    (a) mapping and description of the characteristics and location of the terrestrial and aquatic flora and fauna communities in the vicinity of the Project;
    (b) identification of the indigenous species to be used in the rehabilitation and landscaping works, including flora species suitable as a food resource for threatened fauna species;
    (c) the source of seed or tubestock to be used in rehabilitation and landscaping works including the identification of seed sources within the Project area;
    (d) procedures for vegetation clearing and soil management during construction;
    (e) detailed plans and maps of the construction footprint, areas to be cleared, timing of clearing, important habitat areas, threatened species locations, and vegetation type and location;
    (f) strategies for minimising vegetation clearance within the worksite and protection of vegetated areas outside the worksite area;
    (g) a habitat tree management program including fauna recovery, potential for relocation of hollow bearing trees, compensatory management measures (such as replacement of lost hollows with nesting boxes) and monitoring program of the success of program;
    (h) strategies for transplanting individuals or populations of any threatened plant species affected by the road alignment where possible;
    (i) a Noxious Weed Management Plan including: scope of works, minimising physical disturbance and regular removal of weeds and application of herbicide to newly establishing weed species. This plan must address noxious weed management for both terrestrial and aquatic flora;
    (j) reuse of topsoil and cleared vegetation including weed eradication;
    (k) measures to reuse any surplus vegetation including donation to community groups and distribution to the local community;
    (l) a program for the active management and maintenance of all preserved, planted and rehabilitated vegetation (including aquatic vegetation) including watering regimes, fencing, replacement of vegetation that may have died and weed management; and
    (m) a program for reporting on the effectiveness of terrestrial and aquatic flora and fauna management measures against performance goals.

The Flora and Fauna Management Sub Plan must clearly show how the mitigation measures identified in the EIS and the Representations Report will be implemented during construction and operation.

90. All locations of the threatened species *Asperula asthenes* that occur adjacent to the Project footprint must be fenced (where within the road corridor) and protected from the direct and, as far as practicable, indirect impacts of the Project. Protection from indirect impacts must include the erection of appropriate sedimentation and erosion controls prior to construction and educating construction contractors of the environmental significance of these areas.

91. If, during the course of construction, the Proponent becomes aware of the presence of any threatened species not identified and assessed in the EIS or Representations Report and which are likely to be significantly affected, the Proponent must immediately advise the Director-General of the NPWS and/or Director of NSW Fisheries. No activity which places any of these species at risk must be undertaken until advice about an appropriate response has been received from the NPWS and/or NSW Fisheries. All recommendations by the NPWS and/or NSW Fisheries must be complied with prior to any works likely to affect any threatened species.

92. The Proponent must prepare a Bush Regeneration Plan in consultation with NPWS, DIPNR, GLC and GTCC. This plan must identify disjunct parcels of land, consistent with the EIS and Representations Report, suitable for regeneration and potential connection with existing remnants with the objective of increasing connectivity between remnants and creating wildlife corridors within and adjoining the Project. Management and regeneration of those remnants within the road corridor is the responsibility of the Proponent.

93. Where possible, seed of locally endemic species must be collected prior to the commencement of construction to provide seed stock for revegetation purposes to the satisfaction of a qualified bush regeneration officer acceptable to the NPWS. Topsoil and mulch must be stripped and stored for placement back in the vegetation zone from where it was removed.

94. Weed infested topsoil as identified by a qualified bush regeneration officer acceptable to NPWS must not be used in the rehabilitation works unless it is to be sterilised or treated as specified by the bush regeneration officer.

ATTACHMENT 1

Guidelines for the Establishment of the Community Liaison Groups

The Proponent must consider the following when establishing a Community Liaison Group (CLG):

1. At its first meeting, the CLG shall consider its interrelationship with any existing community liaison or consultative groups of adjoining or interrelated developments.

2. Representatives from relevant government agencies or other individuals may be invited to attend meetings where requested by the CLG.

3. An independent note taker should be provided at the expense of the Proponent, where determined necessary by the CLG.

4. The Proponent must, at its own expense:

    - nominate two (2) representatives to attend all meetings of the Committee;
    - provide to the CLG regular information on the progress of work and monitoring results;
    - promptly provide to the CLG such other information as the CLG may reasonably request concerning the environmental performance of the development;
    - provide access for site inspections by the CLG; and
    - provide meeting facilities for the CLG and take notes of CLG meetings. These notes shall be available to CLG members within 14 days of the meeting.

Where reasonably required by the CLG, the Proponent must provide experts to interpret technical information and tasks of a similar nature for the benefit of the CLG.

APPENDIX A - KIAH ENVIRONMENTAL DESIGNERS REPORT