

Operational Environmental Management Plan

**Annexure G to the Maintenance Manual
Brunswick Heads to Yelgun
Pacific Highway Upgrade**

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1. Introduction

1.1 Background

Abigroup Contractors has a contract with the RTA to design, construct and maintain for 10 years the Brunswick Heads to Yelgun Pacific Highway Upgrade. The Project has involved the construction of an 8.6km, four lane, median divided dual carriageway between the Brunswick Heads South interchange and the Yelgun to Chinderah Freeway as well as substantial works to the old highway.

Much of the Project was constructed through or adjacent to areas with a high environmental value. These environments included protected wetlands, significant vegetation communities, areas containing threatened flora species and fauna habitat. The Upgrade also involved the construction of several major waterway crossings including over the Brunswick River and Marshall's Creek. The location of environmentally sensitive areas are marked on a set of Sensitive Area Plans and listed in Section 2.3.

This Environmental Management Plan addresses environmental issues associated with the maintenance/operational phase of the project, and is part of the Maintenance Manual. The Brunswick Heads to Yelgun Pacific Highway Upgrade will be operated by the NSW Roads and Traffic Authority (RTA), and maintained by Abigroup (Bilfinger Berger) for a period of up to 10 years.

1.2 EMP Requirements

Condition 15 of the Department of Planning approval for the Brunswick Heads to Yelgun upgrade requires the preparation of an Environmental Management Plan for the operational phase. Table 1 addresses the Condition 15 criteria.

Table 1: Requirements of Planning Condition 15

EMP requirement of Condition 15	EMP Reference
An Environmental Management Plan (EMP) (Operation Stage) shall be prepared prior to the commencement of operation. The Plan shall be prepared in consultation with the EPA, DLWC, NSW Fisheries, Byron Shire Council, and any other relevant government agency nominated by the Director-General.	Section 1.5
The Plan shall be prepared in accordance with the conditions of this approval, all relevant Acts and Regulations and accepted best practice management procedures.	Sections 1 and 2 Appendix 1, 2 and 3
The EMP (Operation Stage) shall require approval by the Director-General prior to commissioning or within such time as otherwise agreed to by the Director-General.	Section 1.6
The EMP shall be certified as being in accordance with the conditions of approval by the EMR prior to seeking approval of the Director General.	Section 1.6
The EMP (Operation Stage) shall address at least the following issues:	Sections 1 and 2

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a) Identification of the statutory and other obligations which the Proponent is required to fulfill, 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;	Appendix 1, 2 and 3
b) Sampling strategies and protocols to ensure the quality of the monitoring programme, including specific requirements of the EPA and DLWC;	OEMP Section 5 and Sub Plans in Appendix 6, 7 and 8
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;	Sub Plans in Appendix 6, 7 and 8 and the Maintenance Manual
d) Steps the Proponent intends to take to ensure compliance with all plans and procedures;	OEMP Section 5
e) Consultation requirements, including relevant government agencies, the local community and Council, and complaints handling procedures; and	Section 3.3
f) Strategies for the main environmental system elements and including but not limited to: noise and vibration; water, land slip/settlement, air quality; erosion and sedimentation; access and traffic; property acquisition and/or adjustments; heritage and archaeology; groundwater, contaminated spoil; waste/resource management/removal/disposal; flora and fauna; hydrology and flooding; visual screening, landscaping and rehabilitation; hazards and risks; energy use, resource use and recycling; and utilities.	OEMP Section 4 and 5 and Relevant Sub Plans and Standard Operating Procedures
The EMP (Operational Stage) shall be made publicly available.	Section 1.6
All sampling strategies and protocols undertaken as part of the EMP (Operation Stage) shall include a quality assurance/quality control plan and shall be approved by the relevant regulatory agencies to ensure the effectiveness and quality of the monitoring programme. Only accredited laboratories can be used for laboratory analysis.	Section 5.2 and the relevant Sub Plans and Standard Operating Procedures

Other environmental compliance conditions are listed in section 2 of the EMP.

1.3 Objectives of the EMP

The environmental objectives for the EMP in maintenance contract period are:

- To develop, implement and maintain effective management systems for the environmental aspects of maintenance works.
- To document details of environmental protection infrastructure and controls so that they are able to provide long term protection for the natural environment.

- To ensure compliance with relevant legislation, regulatory requirements and environmental documents.
- To maximise the value and outcomes of environmental monitoring activities so that the information can be applied to the planning and implementation of future projects.

1.4 Scope and format of the OEMP

The Environmental Management Plan for the maintenance period has been prepared as part of Abigroup's 'Maintenance Manual'. The operation stage maintenance framework is illustrated in Figure 1 below.

Where relevant, cross references have been identified to facilitate the interpretation of information and avoid duplication.

Figure 1: Maintenance Document Framework

Maintenance Manual			
Operational Environmental Management Plan			
Environmental Sub Plans			
Soil & Water	Waste and Reuse	Heritage	
Water Erosion and sedimentation Hydrology and flooding Acid sulphate Contaminated soil Landslip/ settlement	Waste management, removal and disposal Energy and resource use Recycling	Indigenous Non-indigenous	
Standard Operating Procedures			
Soil and Water	Flora and Fauna	Waste and Reuse	Noise
Water quality monitoring (E1) Inspection and maintenance of basins (E5) ASS disturbance (E2) Incident Management (M2) Inspection of Waterways (E10)	Monitoring of significant flora (E3) Monitoring of fauna mitigation measures (E6) Maintenance of fauna structures (M6) Monitoring road kills (E7) Weed control (E9) Inspection of Waterways (E10)	Inspection and maintenance of compounds and storage areas (E4)	Noise monitoring (E8)

Standard Operating Procedures (SOPs) support the OEMP and the Maintenance Manual. They provide site specific, technical information in a 'step-by-step' format that will ensure that the project requirements are implemented in a timely and acceptable manner.

1.5 Consultation

In accordance with the Project Approval Conditions, the OEMP, Sub Plans and Standard Operating Procedures have been prepared in consultation with the following key environmental stakeholders:

- The Environmental Management Representative
- The RTA
- Department of Environment and Conservation
- Department of Natural Resources (DLWC)
- Department of Primary Industries (Fisheries)
- Byron Marine Parks
- Byron Shire Council

A draft OEMP was circulated in December 2006, and revisions made in response to comments received in January and February 2007.

1.6 Approval Process

Following the review of the Draft OEMP and Sub Plans by relevant agencies and the RTA, the revised Plan will be forwarded to the Project Environmental Management Representative for certification. Once complete, the OEMP and relevant sub plans will be forwarded to the RTA for referral to the Director General of the Department of Planning for approval.

Following approval, the OEMP and Sub Plans will be made publicly available. The Plan will be available for review at the on-site maintenance compound, at the RTA Pacific Highway Development Office located in Grafton and on the project website.

2. Planning

2.1 Compliance with Environmental Planning Obligations

The project Approval Conditions provided by the Department of Planning, the Department of Conservation and Byron Shire Council include conditions for environmental monitoring and reporting during the maintenance contract period. A summary of these conditions is provided in OEMP Appendix 1. Monitoring of the compliance conditions relevant to the maintenance operations will be undertaken regularly, and reported in the annual reports.

2.2 Legal and Regulatory Obligations

Maintenance and monitoring activities must be planned and implemented in accordance with all relevant legal and regulatory requirements.

2.2.1 Legislative Requirements, Permits and Licences

The NSW environmental legislation that may be relevant to the operational period is listed in Appendix 2 to this OEMP, along with any related approvals, permits and/or licences that may be relevant.

Once the construction phase is completed and the operational stage commences there will be some sediment basins that will still need to be operated as construction-stage basins in accordance with the Environmental Protection Licence. The conditions of this Licence will continue to be required until the DEC agree to its relinquishment, generally when the catchments to the sediment basins are fully stabilized with vegetation.

2.2.2 Deed Requirements

The Project Deed prescribes requirements for the maintenance and/or monitoring of a range of environmental aspects of the upgrade. The following key references were considered in the preparation of the OEMP:

- *Environmental Impact Statement*, Proposed Duplication of the Brunswick Heads Bypass and upgrade of the Pacific Highway Brunswick River to Yelgun, SKM, July 1998, Exhibit P and Q of the Deed
- *Species Impact Statement*, Proposed Duplication of the Brunswick Heads Bypass and upgrade of the Pacific Highway Brunswick River to Yelgun, SKM, July 1998, Exhibit O of the Deed
- *Representations Report* (four volumes), Proposed Duplication of the Brunswick Heads Bypass and upgrade of the Pacific Highway Brunswick River to Yelgun, RTA Technology, February 1999, Exhibit N of the Deed
- *Approval Issued by the Minister for Infrastructure and Planning*, 20 November 2003, Exhibit E of the Deed
- *Director Generals Report*, Department of Urban Affairs and Planning, August 1999, Exhibit M of the Deed
- *Modifications to Approved Project Submissions Report*, RTA Environmental Technology Branch, April 2003, Exhibit H of the Deed

- *Notice of Determination of a Development Application*, Byron Shire Council, January 2004, Exhibit D of the Deed
- *Brunswick Heads to Yelgun Upgrade, Modifications to Approved Project*, Environmental Impact Assessment, Connell Wagner, November 2002, Exhibit H of the Deed
- *Combined Heavy Vehicle Light Vehicle Rest Area at Yelgun, Review of Environmental Factors*, Acacia Environmental Planning, December 2004, Exhibit S of the Deed
- *Upgrading the Pacific Highway Brunswick Heads to Yelgun, Environmental Impact Assessment of a Modification*, Acacia Environmental Planning, December 2004, Exhibit T of the Deed
- Appendix 4 of the SWTC - Additional Environmental Requirements
- SWTC Appendix 14 Environmental Management Plan Guidelines
- SWTC Appendix 25 Code of Maintenance Standards
- QA Specification DCMG36: Environmental Protection (Management System)
- Other documents as listed in Schedule 19 of the Deed, and summarized in Appendix 3.

2.3 Environmentally Sensitive Areas

To aid in the identification and protection of significant environmental features associated with the project, a set of Sensitive Area Plans (SAPs) have been prepared. These Plans provide information relevant to the maintenance period and must be considered prior to commencing any work activity that may require vegetation or ground disturbance.

The Brunswick Heads to Yelgun Pacific Highway Upgrade crosses a number of significant waterways, including the Brunswick River, Marshalls Creek, and two creeks on the Brunswick Bypass. Another un-named creek that flows through the culvert under Coolamon Scenic Drive is a designated 'fish passage', and has been specially designed with a low flow channel.

The remains of the Hainsville Cattle Tick Dip site, a contaminated site, is located underneath the highway embankment in the vicinity of the old Coolamon Scenic Drive.

The following is a summary of the heritage sites of significance:

- the "Scar tree" on the Brunswick Bypass median;
- a potential "middens" site located outside the road reserve (but close to the boundary with) the Brunswick Heads Nature Reserve;
- indigenous artifact to be replaced near where it was found pending discussions with the TBLALC and RTA.

Other environmentally sensitive areas include the Brunswick Heads Nature Reserve, the Billinudgel Nature Reserve, the Byron Marine Park (located at Brunswick River and Marshalls Creek), the Saltmarsh area beside the southbound on-ramp at the Brunswick Heads north interchange, and SEPP14 Coastal Wetlands No 66C, 62, 65 and 57.

Existing rare and endangered vegetation is also shown on the sensitive area plans. The new plantings of threatened species are shown in the landscape plans.

2.4 Environmental Sub Plans

Environmental Sub Plans have been prepared to address three key environmental elements. Figure 1 provides an outline of the issues addressed in each sub plan.

Where relevant, cross references have been highlighted in each sub plan and the Maintenance Manual as well as standard operating procedures.

The following table lists the OEMP sub plans.

Table 2.1: OEMP Sub Plans

Minister's Planning Approval Condition	OEMP Sub plan	Located in this OEMP
AC 17	Soil and Water	Appendix 6
AC 46 and 50	Heritage	Appendix 7
AC 61	Waste and Reuse	Appendix 8

3. Implementation of the OEMP

Maintenance activities will be implemented in a manner that achieves a result consistent with legislative and approval requirements as well as client requirements for reliability, safety and protection of the environment.

3.1 Structure, Responsibility and Resources

The Project Maintenance Manager and Maintenance Supervisor will have a key role in ensuring that the requirements of the OEMP are met. Details of project personnel are provided in Section 3 and Annexure R (Position Descriptions) of the Maintenance Manual, and below are environmental responsibilities. The location of the maintenance office and compound are Clothiers Creek Road, Clothiers Creek.

Table 3.1: Environmental Responsibilities

Operational Project Team Environmental Responsibilities	
Title	Role, Responsibility and Authority
Project Maintenance Manager (Stewart Thorp) Phone (02) 66 777 144	<ul style="list-style-type: none"> • Oversee the implementation of environmental monitoring activities on site. • Obtaining/maintaining environmental approvals/licenses. • Ensure that all key personnel are fully conversant with the OEMP and that activities are planned and conducted such that they comply with the environmental requirements. • Identify the training needs of personnel and subcontractors, prepare training programs/activities and maintain training records. • Prepare any further Activity Guidelines/Standard Operating Procedures for maintenance and monitoring activities. • Establish and communicate environmental requirements for the planning, selection and management of subcontractors. • Monitor and audit the work of subcontractors and consultants against contractual requirements. • Liaise with landholders and the local community (where requested to). • Review and report on the effectiveness of environmental controls and infrastructure. • Periodically review the OEMP to assess its effectiveness and practicality. • Collate, review and report on maintenance and monitoring outcomes. • In consultation with the Quality, Environmental and OHS Management Systems Manager decide whether new environmental procedures are required. Ensure that the corrective action and non-conformance process remains effective.
Maintenance Supervisor	<ul style="list-style-type: none"> • Maintain a high standard of quality control as required by the OEMP and Maintenance Manual. • Ensure maintenance equipment is well maintained and calibrated and that sufficient stocks of maintenance consumables are held. • Manage the efficient operation of all Spill Basins and Gross Pollutant Traps (GPT's), and inspect after significant rainfall events • Provision of spill response kits and the correct storage of dangerous goods • Attend all spillages or incidents and advise on response procedures and remedial/preventative action • Supervise repair and maintenance contracts and coordinate subcontractor work in accordance with this OEMP. Conduct familiarisation and training programs for subcontractors personnel to be engaged. • Manages the "Excavation Permit" and/or "Road Closing Permit", and/or "Dial Before You Dig" permit

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Operational Project Team Environmental Responsibilities	
Title	Role, Responsibility and Authority
	as required, to ensure minimal disruption to services
BBS Management Support (Quality, Environmental and OHS Management Systems Manager)	<ul style="list-style-type: none"> • Review the OEMP annually to assess its effectiveness and practicality. • Provide environmental advice when required. • Role in auditing of management systems and procedures. • Periodically inspect O&M activities for compliance with Activity Guidelines. • Provide input into the preparation of Activity Guidelines. • Attend meetings as required.

The Maintenance Manager is responsible for providing the resources necessary to complete the required tasks in accordance with this OEMP. Some specialised resources may be required to implement some components of the environmental monitoring and management program. A brief description of the possible role of specialist consultants and their contact details are provided in the table below. .

Table 3.2: Environmental Consultants

Position	Name	Contact	Role
Flora consultant	Andrew Benwell	(02) 6684 5496	<ul style="list-style-type: none"> • Flora monitoring (threatened and significant species) • Advise on landscaping, plant maintenance and rehabilitation issues.
Fauna consultant	Mark Fitzgerald	(02) 6684 2989	<ul style="list-style-type: none"> • Monitor fauna movement at identified underpass structures. • Advise on fauna related issues.
Noise consultant	Renzo Tonin and Associates	(02) 8218 0500	<ul style="list-style-type: none"> • Undertake noise monitoring and assessment activities as required by the Conditions of Approval and Operational Noise Management Report. • Provide advice on noise mitigation and management issues.
Heritage	Terri Bonhomme	(07) 5530 2542	Advice on heritage assessment.
Soil Conservation	Gerry Ryan	(02) 6687 4581	Advice on soil conservation and erosion and sedimentation management.
Water quality laboratory	Graham Lancaster	(02) 6620 3678	Water quality laboratory analysis.

Contact details for maintenance personnel will be provided to the RTA, and relevant agencies as required.

3.2. Induction and Training

3.2.1 Site Induction

All project personnel, subcontractors and consultants will be required to undertake a site induction which will, as a minimum, address the following environmental topics:

- the OEMP and consequences of non-compliance with the OEMP
- location of significant environmental sensitive areas and protected vegetation
- incident management procedures (eg the action to be taken in emergencies, communication lines and contact details for emergency services and site representatives)

A record will be kept of induction details and attendees in accordance with Standard Operating Procedure SOP-A05.

3.2.2 Environmental Training

Section 12.10 of the Maintenance Manual provides a matrix for the training of maintenance personnel and sub-contractors.

In addition to the site induction, environmental training will be delivered in accordance with Standard Operating Procedure SOP-A05.

The following environmental training will be delivered for maintenance personnel and sub contractors specific to the work activity they will undertake:

- the location, identification and management of environmentally sensitive areas
- purpose and content of relevant Standard Operating Procedures (refer Annexure K of the Maintenance Manual)

Records of training, competency and qualifications including dates, names and trainer details, will be kept and periodically reviewed in accordance with SOP-A05.

3.3 Communication and Consultation

3.3.1 Reporting

Reporting requirements for the maintenance phase is documented in Section 8 of the Maintenance Manual. The environmental component of the project report for the RTA will address:

- progress on the implementation of conditions of approval and project requirements
- details and outcomes of inspections, monitoring, maintenance and audits conducted on environmental infrastructure (eg fauna underpasses, landscaping and spill basins)
- performance of the work and suggestions for changes/improvements
- environmental incidents
- corrective actions
- complaints, community comments/issues and feedback
- licences, permits and approvals sought/received
- protection of heritage items
- revisions to maintenance plans

The report will include performance against the requirements of the OEMP.

3.3.2 Government Agencies and the Community

This OEMP has been developed in consultation with state agencies. On-going contact with state agencies and the community may be required at various times during the maintenance period. Examples include:

- notification to the RTA and DEC of a major incident on the highway
- notification to DPI (Fisheries) of works that may involve the removal of sediment or snags from a waterway
- notification to Byron Council of impending work, changes to road conditions or environmental incidents or emergencies
- notification to the community of a proposed change to traffic conditions.

3.3.3 Complaints Register

A complaints and enquiry handling system will be implemented during the maintenance period and is documented in Section 8.8 of the Maintenance Manual. This will require the following records to be kept:

- Date, time and nature of the complaint or inquiry
- Type of communication (telephone, letter, meeting etc)
- Name, address, contact number
- Nature of complaint
- Response details.

Details on complaint management plus the handling of media enquiries are provided in the Maintenance Manual.

3.4 Emergency Preparedness and Response

Emergency call out management is documented in Section 8.6 of the Maintenance Manual and the Standard Operating Procedure M2 (refer to Annexure K of the Maintenance Manual).

During the maintenance period, a range of preventative measures will be undertaken by the Maintenance Manager to reduce the risk of an incident occurring, including:

- inspections of areas considered to have an environmental pollution risk eg. storage areas and compounds, refer to SOP-E4
- regular monitoring and auditing of activities, work methods, management systems, personnel and subcontractors, refer to OEMP Section 5
- completion of checklists and record sheets in a timely manner, refer to OEMP Appendix 5
- the provision of inductions and training, refer to OEMP Section 3.2, and Section 12.10 of the Maintenance Manual
- maintenance of stocks of emergency response equipment, refer to OEMP Section 3.4.1 below.

3.4.1 Incidents and Emergency Response

An environmental incident may include a spillage or major leak, failure of a pollution control device such as a bund or basin, major settlement, collapse of bank or embankment, slip failure of cuts slopes or fill embankments, fire (eg loss of ground cover vegetation), damage to protected vegetation or animals on the highway.

Incident management is detailed in the Maintenance Manual and SOP-M02.

In order to be prepared for a potential chemical or fuel spill from a traffic accident on the highway, the Maintenance Manager will provide a set of drawings which show the location of the Water Quality Spill Basins to the local emergency services team leader at the commencement of the maintenance phase of the project. These basins have valves that, when turned off, can contain at least 20,000 litres within the basin. Refer to SOP-E5 for managing the basin after a spill or incident.

The following framework supports the standard operating procedure, for consideration of the Maintenance Manager and Supervisor:

Define the problem

- Establish the details of the immediate problem to facilitate the identification of short term response options.

Manage the situation

- The safety of any person, either works or others involved, is the priority.
- Minimise environmental damage as quickly as possible. In a spill situation, use sandbags, absorbent material, soil, an excavation or barrier to prevent the pollutant from reaching a watercourse.
- Advise the RTA.

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- Advise the DEC if the incident 'causes or threatens to cause material harm to the environment'. *
- Clean up the problem.

* Pollution incidents causing or threatening material harm to the environment must be notified to the DEC. A 'pollution incident' includes a leak, spill or escape of a substance, or circumstances in which this is likely to occur. Material harm to the environment' includes on-site harm, as well as harm to the environment beyond the premises where the pollution incident occurred.

After the event

- Develop an action plan to prevent a similar incident occurring again.
- Develop a rehabilitation plan to address any remaining environmental effects (if any).
This would include the following contingencies:
 - Contact the relevant government agencies (eg. DPI(Fisheries) and DEC) if the incident involves impact of sediment on a waterway or Saltmarsh area,
 - Create an action plan in consultation with the relevant government agency
 - The action plan may involve the re-establishment of a permanent stabilized surface.
- Restoring the controls
- Prepare a report on the incident.

Notification of major incidents or accidents for example, those involving a vehicle, truck rollover or loss of load (spillage) occurring as a result of the operation of the upgrade will be provided to the RTA by Abigroup, the community or key contacts, who will coordinate an emergency response involving external agencies. Abigroup maintenance personnel may be requested to assist with this response.

A list of key contacts, phone (business and after hours) will be maintained and displayed. This list is provided at the front of the Maintenance Manual.

Emergency response equipment including booms, absorbent material, MSDS sheets, spill kits, sandbags, sediment fence and flocculating agent, will be located at the maintenance compound. Personnel will be provided with training and basic instructions for use.

The content of emergency equipment stores will be checked by the Maintenance Supervisor on a 6 monthly basis.

A register of MSDSs will be kept at the maintenance compound and updated every 6 months and as new materials are brought to site to ensure that all chemicals and other materials have been identified.

An environmental incident is defined as an event which either resulted in, or could have resulted in, pollution of the environment. In accordance with the POEO Act 1997, it is an offence not to report incidents to the DEC where environmental harm may exceed \$10,000.

All incidents will be investigated and the following details recorded:

- The cause and extent of the incident
- Corrective action identified and implemented
- Personnel responsible for implementing the corrective action

- Modification or new controls required to prevent the incident occurring again
- Changes in procedures or safeguards required
- Details of waste and contamination treatment and/or disposal.

As required by the Project Deed, immediate notification will be provided to the RTA (in writing) of any breach, potential breach, non-compliance or potential non-compliance with the conditions of approval, requirements of any of the environmental documents or any Law.

3.5 Flora and Fauna Maintenance

All maintenance works associated with the project will need to be aware that there are a range of environmentally sensitive areas adjacent to the project boundary (eg. nature reserves and saltmarsh areas).

Even landscaping works undertaken outside of the road reserve will be monitored and maintained by a suitably qualified landscape specialist for a period of three years after commissioning.

Once construction of the Brunswick Heads Nature Reserve Access Road is complete, the DEC will be responsible for the on-going maintenance of all work carried out within the Nature Reserve.

A very large tree with indigenous heritage significance, the 'Scar Tree', is located at 43,100 on the Brunswick Bypass median. If the tree or its branches needs attention because it poses a traffic safety hazard, then consult an arborist and the RTA prior to trimming branches of the tree.

A number of Standard Operating Procedures have been developed as a guide, and described below.

3.5.1 Monitoring Protected Flora Roadside

There are over 200 remaining individual threatened and rare flora species in proximity to the upgrade road alignment (some of this number are outside the actual road reserve). All these have been identified, tagged and numbered by the Project Ecologist prior to the commencement of construction. These have also been regularly monitored during the course of the construction period.

These plants will be protected during the maintenance phase by:

- Identifying the position of individual plants on the Sensitive Area Plans
- Highlighting the presence of these in the site inductions to all project personnel and subcontractors
- Monitoring and reporting on the health of the plants on an annual basis for three years following completion of construction, and maintaining the plant identification tagging that has been used during the construction phase.

The procedure for monitoring threatened plant species is detailed in Standard Operating Procedure E3, located in an Annexure to the Maintenance Manual.

These plants will be monitored, and as a minimum will record:

- The plant and its identification number
- The species, its height and width of the individual
- The foliage condition of the individual
- Evidence of reproductive activity and recruitment of the individual, and
- Details of maintenance activity and any other relevant information.

The monitoring report will be provided to RTA. The RTA are to forward to any relevant state agency such as DEC.

3.5.2 Landscape Maintenance and Weed Management

The routine aspects of landscape maintenance such as intervention levels and maintenance standards are detailed in a separate document, the Landscape Maintenance Report which is part of the Maintenance Manual.

Slashing, mowing and weed control will not be undertaken in environmentally sensitive areas such as SEPP14 wetland areas.

Prior to any trimming of trees that overhang the road reserve from the Brunswick Heads Nature Reserve, approval of an environmental assessment is required from the Department of Environment and Climate Change (DEC). A template is provided in the appendix to assist with this.

During the maintenance phase of the project no native plant material shredded or otherwise, is to be redistributed into the Brunswick Heads Nature Reserve. The DEC will take over the maintenance of the Brunswick Heads Nature Reserve Access Road area.

An integrated weed management approach involving both non-herbicide and targeted herbicide controls will be used.

A hierarchy of weed control methods proposed are as follows, in order of preferred use:

- Reafforestation – This preferred approach involves the establishment of a dense canopy of foliage of native trees/shrubs on the road batters and surrounding areas. The aim of reafforestation is to form a dense tree canopy that restricts sunlight penetration to weeds on the forest floor that provides long-term weed control. This is the goal of many of the landscape plantings on the project. Mature trees compete for moisture, nutrients and sunlight, therefore restricting potential weed establishment and growth.
- Cultivation, hand picking, and the provision of good clean mulch cover are other methods of weed management to be adopted. This method may be used when weeds, such as vines overgrow and potentially impact Threatened Species. Care should be taken when removing weeds from protected vegetation.
- Methods of limited chemical application of herbicide for the maintenance stage may include gas gun, granular, stem injection, cut stump, hand spray, foliar spray or wickwiper.

When herbicide is used on site, record the application details on Standard Form SF-08 *Pesticide Application Record*, referenced in an Annexure of the Maintenance Manual.

Also refer to the standard operating procedures SOP-E09 which includes the requirements of RTA Environmental Direction No 18 on this matter.

3.5.3 Noxious Weeds

Section 13 of the *Noxious Weeds Act 1993* requires the control of listed noxious weeds to the extent necessary to prevent the weeds from spreading to adjoining land.

The procedure for weed control is documented in Standard Operating Procedure E9, listed in Annexure K of the Maintenance Manual.

The following table contains a list of the Noxious Weed species that have been identified on the project by the project ecologist.

Table 3.3: List of Noxious Weeds in project area

Species Name	Common Name
Noxious weeds	
<i>Ageratina adenophora</i>	Crofton weed
<i>Ageratina riparia</i>	Mistflower
<i>Baccharis halimifolia</i>	Groundsel bush
<i>Chrysanthemoides monilifera</i> <i>subspecies rotunda</i>	Bitou bush
<i>Cinnamomum camphora</i>	Camphor laurel
<i>Lantana</i>	Lantana

Source (www.dpi.nsw.gov.au/agriculture/noxweed/ and Benwell 2005)

More information on general weed management is available from the DPI website:

<http://www.agric.nsw.gov.au/reader/weeds>

Another source of information is the North Coast Control Weeds Advisory Council:

<http://www.northcoastweeds.org.au/index.htm>

Guidance on control techniques for each of weed species identified is outlined in the Noxious and Environmental Weed Control Handbook 3rd Edition. Copies of this handbook can be downloaded for free from:

http://www.dpi.nsw.gov.au/_data/assets/pdf_file/123317/noxious-and-environmental-weed-control-handbook-3rd-edn.pdf

3.5.4 Management of Other Weeds

Although the primary weed management effort will target the noxious weeds described above, some of the non-noxious weeds listed in Table 6 will also receive attention in accordance with the hierarchy listed in Section 3.5.2 above.

Twin-leaf Vine (*Pithecoctenium cynanchioides*) will be suppressed in the Wetland B area, which is next to the Brunswick Heads Nature Reserve. This will be undertaken with trained Bush Regenerators who will carefully remove and dispose of the plants. The other weed species will be monitored, and controlled if they are likely to affect any of the Threatened Species on the project alignment.

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Table 3.4: List of local non-noxious Weeds

Species Name	Common Name	Abundance	Method of spread
Herbs			
<i>Asclepias curassavica</i>	Blood Flower	Rare	Soil SB
<i>Ageratum houstonianum</i>	Billygoat Weed	Common	Soil SB
<i>Bidens pilosa</i>	Farmers Friend	Occasional	Soil SB
<i>Cirsium vulgare</i>	Spear Thistle	Occasional	Soil SB
<i>Commelina bengalensis</i>	Blue Sailor	Occasional	Soil SB, Rhiz.
<i>Gomphocarpus fruticosus</i>	Balloon Plant	Occasional	Soil SB
<i>Hypochaeris radicata</i>	Flatweed	Occasional	Soil SB
<i>Senecio madagascarensis</i>	Fireweed	Occasional	Soil SB
<i>Tradescantia albiflora</i>	Wandering Jew	Occasional	Rhiz
Grasses			
<i>Andropogon virginicus</i>	Whiskey Grass	Occasional	Soil SB
<i>Axonopus affine</i>	Carpet Grass	Common	Soil SB, Rhiz.
<i>Choris gayana</i>	Rhodes Grass	Occasional	Soil SB, Rhiz.
<i>Melinis multiflora</i>	Molassus Grass	Occasional	Soil SB, Rhiz.
<i>Panicum maximum</i>	Guinea Grass	Occasional	Soil SB
<i>Paspalum urvillei</i>	Vasey Grass	Common	Soil SB, Rhiz.
<i>Paspalum wettsteinii</i>	Broadleaf Paspalum	Common	Soil SB, Rhiz.
<i>Pennisetum purpureum</i>	Elephant Grass	Rare	Rhiz.
<i>Setaria sphacelata</i>	Setaria	Common	Soil SB
Shrubs			
<i>Ligustrum sinense</i>	Small-leaved Privet	Occasional	
<i>Ochna serrulata</i>	Ochna	Rare	Soil SB
<i>Senna floribunda</i>	Smooth Senna	Occasional	Soil SB
<i>Senna pendula</i>	Winter Senna	Common	Soil SB
<i>Solanum mauritianum</i>	Tobacco Bush	Occasional	Soil SB
<i>Phytolacca octandra</i>	Inkweed	Rare	Soil SB
Trees			
<i>Erythrina X sykesii</i>	Coral Tree	Rare	Rhiz
<i>Schefflera actinophylla</i>	Umbrella Tree	Occasional	Soil SB
Vines and creepers			
<i>Desmodium uncinatum</i>	Silver-Leaf Desmodium	Rare	Soil SB
<i>Ipomoea purpurea</i>	Common Morning Glory	Occasional	Soil SB/Rhiz.
<i>Macroptilium atropurpureum</i>	Siratro	Occasional	Soil SB
<i>Passiflora edulis</i>	Passionfruit	Occasional	Soil SB
<i>Passiflora suberosa</i>	Corky Passionflower	Common	Unsure
<i>Passiflora subpeltata</i>	White Passionflower	Common	Unsure
<i>Pithecoctenium cynanchioides</i>	Twin-leaf Vine	Common	Soil SB/Rhiz.

Source: Weed survey for the Brunswick Heads to Yelgun Pacific Highway, by Dr Andrew Benwell (June 2005).

3.5.5 Fauna Underpasses and fences

Monitoring of the fauna underpasses will be undertaken for the three years.

The fauna monitoring will be undertaken in accordance with the Standard Operating Procedure SOP-E6 *Monitoring of Fauna Structures*. Maintenance will be provided in accordance with SOP-M6 *Maintenance of Fauna Structures*, listed in Annexure of the Maintenance Manual.

The terrestrial fauna underpass sites are listed in the following table.

Table 3.5: Fauna Passage Sites

Location (Chainage)	Structure
42450	2.4 x 1.5 box culvert
42890	2.4 x 1.2 box culvert
43130	2.4 x 1.2 box culvert
43200	Bridge span
43370	2.4 1.2
43450	Bridge
43550	2.4 x 1.2 box culvert
43650	2.4 x 1.2 box culvert
43830	2.4 x 1.2 box culvert
44040	2.4 x 1.2 box culvert
44900	Brunswick River Bridge
48800	Marshall's Creek Bridge
49050	Marshalls Creek Overflow Bridge
50380	Raised, 1.5 diameter pipe
50720	2.4 x 1.2 box culvert

There is also a designated fish passage culvert below the Coolamon Scenic Drive underpass at Chainage 47300, and a designated glider crossing (overpass) location around 43050 to 43300 on the Brunswick Bypass.

3.5.6 Fauna Exclusion Fences and Injured Fauna

There will be regular inspections of the fauna exclusion fences to ensure their effectiveness. The inspection and maintenance regime is detailed in Standard Operating Procedure SOP-M06 *Maintenance of Fauna Structures* listed in Annexure of the Maintenance Manual. The maintenance standard is set out in R-11 *Fencing*, and Activity Guideline AG3 *Fauna Fencing Maintenance* in the Maintenance Manual.

If there has been an incident on the highway with an animal, refer to Standard Operating Procedure M2 *Incident Management*. If any shocked or injured fauna are found along the highway alignment they should be handled carefully. Animal carers may be contacted to assist with animal care:

WIRES	Phone 1800 641 188
Billinudgel Veterinary Hospital	Phone (02) 6680 3480.

Road kills along the length of the project alignment will be monitored and daily records kept by the Maintenance Manager. The procedure for monitoring of road kill is

documented in Standard Operating Procedure E7, listed in Annexure of the Maintenance Manual.

For each fauna road kill record, the Maintenance Manager will investigate how each animal accessed the road and record this in the database. The data will be provided to RTA on a monthly basis (ref. SWTC Appendix 5, Section 5.4(j)), and will include number of animals, the type of species, indicative age class (ie. Adult or juvenile), exact location and carriageway side.

3.6 Aquatic Habitat Management

Monitoring of mangrove re-growth on the Brunswick River foreshore (north and south side) at the site of the demolition of the old Brunswick River bridge, as well as at the site of the new bridge is part of the landscape maintenance for the project.

The management of the Saltmarsh area to the east of the Brunswick Heads North Interchange is not included in the maintenance of this project, but will be managed separately by the RTA.

The Standard Operating Procedure E10 *Maintenance at Waterways* includes procedures and protocols to remove debris, flood litter and accumulated sediment at creek and culverts, however such maintenance work must be undertaken avoiding disturbance of the creek bed and bank vegetation. Aquatic vegetation such as mangroves and SEPP14 areas are protected.

The maintenance of the main transverse culverts under the Coolomon Scenic Drive underpass (Station 47,300) is of special interest because these have been designed as a "fish passage". Refer to Standard Operating Procedure SOP-E10 for fish passage sites and maintenance details. Refer also to SOP-M06 for *Maintenance of Fauna Structures* and inspections.

3.7 Operational Noise Management Maintenance

Within six months of opening the Project, noise monitoring shall be conducted at selected representative locations along the Project route to give a minimum of seven days of data (excluded adverse weather). Classified traffic monitoring shall be conducted simultaneously with the noise monitoring to identify traffic flows and mixes.

The details of the monitoring locations are documented in the *Operational Noise Management Report* prepared for the project by Renzo Tonin and Associates.

The procedure for noise monitoring is documented in Standard Operating Procedure E8, listed in Annexure K of the Maintenance Manual.

Noise monitoring results shall be reviewed and the adequacy of the traffic noise mitigation measures shall be assessed in consultation with the RTA, DEC and the Planning Director-General.

3.8 Property Acquisitions and Adjustments

All affected property which is not acquired by the RTA has been or will be restored within 3 months of completion of works. There will not be any further need for property acquisition, adjustments or establishment of alternative access arrangements following completion of construction works.

4. Environmental Aspects, Impacts and Risks

4.1 Risk Assessment

The risk assessment process utilised is based on the Australian Standard, (AS/NZS 4360:2004) Risk Management, which utilises qualitative measures to estimate the consequence or impact of an event, along with the estimate of likelihood.

For each potential hazard, the strategy of examining the “consequence” prior to the “likelihood” was conducted to ensure the implications are not overlooked purely because a hazard is assessed as having a lower likelihood of occurrence. A simple assessment of L (Low), M (Medium) and H (High) was used for the assessment of consequence. For each potential hazard, the likelihood of the occurrence was noted. A simple assessment of L (Low), M (Medium) and H (High) was used for the assessment of likelihood of occurrence.

The following Risk Analysis Matrix was applied to assess the priority of the various hazards identified.

Table 4.1: Predicted Level of Risk

Likelihood	Consequences				
	Insignificant	Minor	Moderate	Major	Catastrophic
A (almost certain)	L	M	H	H	H
B (likely)	L	M	H	H	H
C (moderate)	L	M	H	H	H
D (unlikely)	L	L	L	M	H
E (rare)	L	L	L	M	M

Adopted from the Australian Standard (AS/NZS 4360:2004), reference Annexure V of the Maintenance Manual.

Legend:

H = High Risk
M, = Moderate Risk
L = Low Risk

4.2 Environmental Impacts & Control Measures

A summary of the results of the risk management analysis along with the identification of environmental aspects and their subsequent environmental impacts, including mitigation strategies for all key risks, are provided in Table 4.2. The Maintenance Manager will regularly review the environmental risks associated with operational and maintenance activities and update systems accordingly.

The identification of environmental aspects and impacts is important to the selection of environmental safeguards and work methods for operational activities such as maintenance. The specific aspects and impacts of the maintenance activities required during the operation of the project have been identified.

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Table 4.2: Aspects, Impacts and Controls associated with the Operational Phase

Environment System Element	Aspect	Impacts	Risk	Operational Mitigation/Control Measures	Monitoring and frequency
Noise and vibration	<ul style="list-style-type: none"> Noise and vibration from the road 	<ul style="list-style-type: none"> Impact on local sensitive receivers - exceedance of the relevant criteria. 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Generally the maintenance works will be carried out to prevent noise nuisance and disturbance, refer to Section 7.1 of the Maintenance Manual. Maintenance of noise walls as part of the road asset & infrastructure – refer to the Maintenance Manual (Code of Maintenance Standards) for more details. For noise monitoring procedures and consultation refer to OEMP Section 3.7, and to SOP-E8 <i>Noise Monitoring</i>. 	
Surface water	<ul style="list-style-type: none"> Vehicle traffic over creek and River crossings Release of water from basins Removal of sediment and debris from pit, drain and culvert maintenance works Rectification of drain and batter scour 	<ul style="list-style-type: none"> Increased sedimentation and turbidity of water bodies from dust generation caused by movement of vehicles on road Potential for oil/fuel leakages into waterways Degradation of water quality in watercourses Reduced capacity for the capture of polluted runoff Release of polluted water or contamination to the environment Disposal of sediment Blockage of streams 	<ul style="list-style-type: none"> Low High Low Low Low 	<ul style="list-style-type: none"> Refer to the Soil and Water Management Plan (OEMP Appendix 6) 	
Flooding and hydrology	<ul style="list-style-type: none"> Change to flood regime due to topographical changes and modification of catchments 	<ul style="list-style-type: none"> Damage to property and environment 	<ul style="list-style-type: none"> Med 	<ul style="list-style-type: none"> Refer to the Soil and Water Management Procedure for monitoring and mitigation measures (OEMP Appendix 6) 	

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Environment System Element	Aspect	Impacts	Risk	Operational Mitigation/Control Measures	Monitoring and frequency
Land slip/ Settlement/ Groundwater	<ul style="list-style-type: none"> Changes to surface profile causing water ingress to soil 	<ul style="list-style-type: none"> Impact on slope stability and groundwater levels 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Refer to the Soil and Water Management Plan (OEMP Appendix 6) 	
Air quality	<ul style="list-style-type: none"> Unprotected surfaces (eg from stockpiles and/or bare batters) 	<ul style="list-style-type: none"> Dust generation 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Cover or stabilize stockpiles to prevent wind erosion Maintain landscape coverage 	<ul style="list-style-type: none"> In accordance with Maintenance Manual and landscape maintenance
Soil erosion and sedimentation	<ul style="list-style-type: none"> Maintenance works that excavate soils 	<ul style="list-style-type: none"> Sediment run off into local streams, water courses and block drainage infrastructure 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Refer to the Soil and Water Management Procedure for monitoring and mitigation measures (OEMP Appendix 6) 	
Access and traffic	<ul style="list-style-type: none"> Temporary road works 	<ul style="list-style-type: none"> Restricted access to motorists, pedestrians and cyclists 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Maintenance Supervisor to arrange appropriate signage, notification, and identification of alternative routes 	<ul style="list-style-type: none"> Prior to temporary works commencing, and in accordance with Road Occupancy Licence
Heritage and Archaeology	<ul style="list-style-type: none"> Routine maintenance activity 	<ul style="list-style-type: none"> Damage to heritage item 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Refer to Heritage Management Plan (OEMP Appendix 7) 	
	<ul style="list-style-type: none"> Excavation of soils 	<ul style="list-style-type: none"> Impacts to indigenous artefact materials 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Refer to Heritage Management Plan (OEMP Appendix 7) 	
Contaminated Spoil	<ul style="list-style-type: none"> Disposing newly contaminated soils Unearthing existing contaminated soil 	<ul style="list-style-type: none"> Occupational Health and Safety of workers exposed to chemicals Ecological off site impacts of contamination 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> The OH&S Manual, part of the Maintenance Manual Refer to OEMP Section 2.3, Section 4 of the Waste and Reuse Management Plan (OEMP Appendix 8) and the Soil and Water Management Sub Plan (OEMP Appendix 6). 	<ul style="list-style-type: none"> OHS in accordance with Maintenance Manual. No long term monitoring required for the former Hainsville cattle tick dip site

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Environment System Element	Aspect	Impacts	Risk	Operational Mitigation/Control Measures	Monitoring and frequency
Waste/ Resource Management/ Removal/ Disposal/ Recycling	<ul style="list-style-type: none"> Waste management 	<ul style="list-style-type: none"> Incorrect disposal of waste Inefficient resource use 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Refer to the Waste and Reuse Management Plan (OEMP Appendix 8) 	
Flora and Fauna/ Landscaping/ Visual screening	<ul style="list-style-type: none"> Weed management activities Maintenance of new plantings 	<ul style="list-style-type: none"> Inappropriate control of weeds leading to spread of weed; Impact of weed management techniques on newly planted vegetation (kill through overspray), and on Threatened Species 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Refer to Section 3.5 of this OEMP and SOP E3 <i>Control of Weeds</i>. 	<ul style="list-style-type: none"> Refer to OEMP Section 3.5 and SOP E3.
	<ul style="list-style-type: none"> Vegetation control and removal of debris from waterways 	<ul style="list-style-type: none"> Maintenance activity disturbing the creek bed and aquatic vegetation Damage or instability to creek banks Damage to riparian vegetation 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Refer to OEMP Section 3.5 and 3.6 and SOP E10 Refer to OEMP Section 3.3.2 for communication to government agencies 	<ul style="list-style-type: none"> Refer to SOP E10 <i>Maintenance at Waterways</i>
	<ul style="list-style-type: none"> Management of batter drainage and/or fauna fence 	<ul style="list-style-type: none"> Inadvertent damage to protected, threatened plant species 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Refer to SOP E10 <i>Maintenance at Waterways</i>, and SOP E3 Monitoring of Threatened Vegetation Species 	
Waste and waste-water	<ul style="list-style-type: none"> Wash down and cleaning activities 	<ul style="list-style-type: none"> Contaminated water Localised pollution Pollution of waterways 	<ul style="list-style-type: none"> High 	<ul style="list-style-type: none"> Refer to the Soil and Water Management Plan (OEMP Appendix 6) Refer to separate management procedures for the management of the toilet system at the Yelgun Rest Area. 	<ul style="list-style-type: none"> Monthly inspection of wash down facilities SOP E4. Water pollution control measures managed in accordance with the Soil and Water Quality Management Plan (OEMP Appendix 6)

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Environment System Element	Aspect	Impacts	Risk	Operational Mitigation/Control Measures	Monitoring and frequency
	<ul style="list-style-type: none"> Collection of roadside litter and waste from litter bins (e.g. rest areas) and traps 	<ul style="list-style-type: none"> Pollution of the environment Off-site impacts (littering) Harm to fauna Incorrect disposal Disposal to landfill 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Refer to Waste and Reuse Management Plan (OEMP Appendix 8). Refer also to the management of the Yelgun Rest Area in the Maintenance Manual. 	<ul style="list-style-type: none"> Inspection of highway and Rest areas in accordance with Maintenance Manual and the Waste and Reuse Management Plan (OEMP Appendix 8).
Dangerous Goods /Hazardous Materials	<ul style="list-style-type: none"> Collection of hazardous spill/ contaminated waste, Major spills on motorway Activities requiring use of fuel Accidental spillage from fuel and chemical storage 	<ul style="list-style-type: none"> Contamination of soil or groundwater and costly clean up and disposal costs Generation of waste 	<ul style="list-style-type: none"> High High 	<ul style="list-style-type: none"> Maintenance Supervisor to arrange provision of spill response kits, and correct storage of dangerous goods. Refer to Waste and Reuse Management Plan (OEMP Appendix 8), and SOP E4 inspection and maintenance of compounds and storage areas. 	<ul style="list-style-type: none"> Water quality monitoring in accordance with the Soil and Water Quality Management Plan Inspection and maintenance of compounds/storage areas in accordance with SOP E4.
Energy Use	<ul style="list-style-type: none"> Vehicle use on the Pacific Highway 	<ul style="list-style-type: none"> Fuel consumption 	<ul style="list-style-type: none"> Low 	<ul style="list-style-type: none"> Substantial energy conservation is achieved by switching vehicle traffic onto the new Pacific Highway upgrade, which eliminates sub-standard curves, improves grades, reduces travel distances and uses concrete pavements. 	<ul style="list-style-type: none"> Once traffic is switched to new Pacific highway upgrade no further monitoring is required.

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Environment System Element	Aspect	Impacts	Risk	Operational Mitigation/Control Measures	Monitoring and frequency
Utilities	<ul style="list-style-type: none"> • Excavation of Utility Services 	<ul style="list-style-type: none"> • Soil and vegetation disturbance causing <ul style="list-style-type: none"> ○ Localised pollution (dust) ○ Pollution of waterways due to soil erosion ○ Damage to vegetation • Disruption to utility service 	<ul style="list-style-type: none"> • Med 	<ul style="list-style-type: none"> • Refer to Soil and Water Management Plan (OEMP Appendix 6) • Maintenance Supervisor manages an "Excavation Permit" and/or "Road Closing Permit" and/or "Dial before you dig" permit as required. 	<ul style="list-style-type: none"> • Refer to Soil and Water Management Plan (OEMP Appendix 6)

5. Compliance and Evaluation of the EMP

5.1 Monitoring Checklists

A checklist of commitments, obligations and actions required by the EMP has been prepared and is provided in OEMP Appendix 5. The checklist will require environmental audits to be undertaken.

This monitoring checklist will be completed on a 6 monthly basis by the Maintenance Manager to ensure that the commitments contained in the OEMP have been met.

5.2 Monitoring, Inspection and Test Plans

A maintenance inspection and monitoring schedule is included in an Annexure of the Maintenance Manual.

The timing, frequency, methodology, locations and responsibilities for environmental monitoring and inspections are specified in the respective OEMP Management Sub Plans and Standard Operating Procedures. The monitoring programs range from sample collection and analysis to those involving a more qualitative assessment. Refer to the action timing summarized in Table 5.1 below.

Table 5.1: A summary of environmental Monitoring and Inspection timing

SOP-E1	Water quality monitoring undertaken Quarterly in the First Year
SOP-E3	Threatened plant species monitoring Annually for Three Years
SOP-E4	Storage Areas inspected Quarterly
SOP-E5	Spill basins and constructed wetlands assessed Annually, and after spills
SOP-E6	Fauna movement monitoring Annually for Three Years
SOP-E7	Road Kill monitored daily, and reported Monthly
SOP-E8	Operational noise monitored and reported within Six Months of opening
SOP-E9	Weed inspection and reporting Annually
SOP-10	Maintenance at waterways, assessed Annually and after flood events
SOP-11	Monthly environmental inspections shall be undertaken for any maintenance works identified through the environmental risk assessment.
SOP-M6	Six monthly inspections of fauna structures

All sampling strategies and protocols undertaken as part of the OEMP shall include a quality assurance/quality control plan in accordance with the overarching project Maintenance Manual.

The procedures for the collection of water samples will include:

- Obtain 1 - 2 litre clean plastic bottles from the laboratory,
- Rinse 1/2 dozen times with the sample to be collected
- For creek waters take sample at 10-20 cm depth and away from the bottom and sides.
- Fill bottles to overflowing then cap to ensure minimal air is present.

- Fresh samples are preferred, supplied to the laboratory the same day of collection. Immediately following collection the samples should be maintained in a cool condition, out of direct sunlight.
- For overnight transport esky packaging and ice bricks are required.

The collection procedure for soil samples are

- approx. 200g of soil (approx. 1 large handful), sealed in a plastic bag, is required fresh to the laboratory (or frozen in some cases).
- Notification to the laboratory of arrival of samples is required.
- Samples in most cases can be stored/delivered cold (in an esky with ice) until delivery is possible.

Only accredited laboratories shall be used for laboratory analysis.

Compliance inspections will also be undertaken to ensure that maintenance and monitoring activities comply with:

- the OEMP and sub plans
- the Maintenance Manual - Standard Operating Procedures
- Approval and regulatory requirements.

Inspections and environmental audits will be documented, followed up and closed out. Corrective action requests will be implemented and reviewed to prevent any reoccurrence of a non-conformance.

5.3 Non conformance Procedures

Environmental Incident Report (EIR) forms and Environmental Improvement Notices (EIN) will be completed by the Maintenance Manager for any environmental incident or non-compliance.

Corrective Actions following an environmental incident will be determined by the Maintenance Manager and will be dependant upon and appropriate to the nature and extent of the environmental incident. However key actions will include nominating someone responsible for taking preventative action to eliminate the possibility of a similar incident occurring again.

5.4 Sub-Contractor's Environmental Management

Major sub-contractors, such as those that undertake repair and replace asphalt or concrete pavement, will be required to prepare and submit their own Environmental Management Plan.

These sub-contractor Environmental Management Plans will document their own environmental control procedures and standard operating procedures, and be submitted to the Maintenance Manager for approval.

5.5 Post Commissioning Environmental Assessment

5.5.1 Within 28 Days after Construction Completion

An environmental compliance audit, including site inspection and full review of environmental records, will be carried out within 28 days after the Certificate of Construction Completion. The audit would identify any environmental protection measures which have not yet been finalised. The condition of environmental protection controls shall be recorded and controls which need ongoing management will be itemised. The audit report is required to be submitted to the RTA's representative together with a written response on how all actions and issues raised in the audit will be addressed.

5.5.2 Twelve Months after Commissioning

After commissioning the upgrade, an assessment shall be made on the key impact predictions made in the EIS and supported by supplementary studies. The assessment will detail the extent to which actual impacts reflect the predictions. Refer to Ministers Approval 16 (detailed in Appendix 1).

An Environmental Assessment Impact Report (EAIR) shall provide details on actual versus predicted noise and vibration impacts on local residences and nearby buildings, flora and fauna mitigation measures, geotechnical issues (including land slip) and all other key impact issues identified in the EIS. The suitability of implemented mitigation measures and safeguards shall also be assessed. The report shall also assess compliance with the OEMP to date.

The EIAR is due twelve months after commissioning of the project, and will be provided to the RTA. The RTA are to forward to DG Planning, and any other relevant state agency.

6. OEMP Review and Improvement

The OEMP and Sub Plans will be reviewed after the first twelve months of the maintenance contract to ensure that it adequately addresses the identified issues and the activities being undertaken during the operation of the upgrade. Follow up reviews will take place each 2 or 3 years after that.

The review will be initiated by the Maintenance Manager and will consider as a minimum:

- Client's comments
- audit findings
- environmental monitoring outcomes
- incidents and non-conformances
- changes in organisational structure and responsibilities
- changes in standards and legislation.

Document and inform RTA of the review. Between reviews the Maintenance Manager will have the authority to make changes or additions to the system by way of an addendum for example, to meet the particular requirements of the client or reflect a change in work method arising from a non-conformance. Any feedback from the state government agencies may also be taken into consideration in the review.

7. Records Management Procedures

The Maintenance Manager will be responsible for the management of environmental records including the resources and training to maintain the following:

- The OEMP
- Monitoring data (water quality, noise, flora, fauna, road kills)
- Inspection reports (internal and external)
- Maintenance activity details
- Checklists
- Induction and training details
- EIRs and EINs
- Complaints/comments register
- Audit reports and follow up (internal and external)
- Subcontractor monitoring
- Waste management records (quantity, disposal location etc)
- Meeting minutes
- Monitoring environmental planning obligations
- Correspondence

Records will be held for at least ten years and will be accessible to the RTAs Representative and to authorized DEC and Council officers. Records will be managed in accordance with the Maintenance Manual SOP-M07.

8. Standard Operating Procedures

The following list of standard environmental operating procedures for specific activities is listed in the Maintenance Manual:

- E1 Water Quality Monitoring
- E2 Managing Acid Sulphate Soils
- E3 Monitoring Threatened Plants
- E4 Environmental Management of Storage Areas
- E5 Management of Spill Areas
- E6 Monitoring of Fauna Structures
- E7 Monitoring of Road Kill
- E8 Noise Monitoring
- E9 Weed Control
- E10 Maintenance at Waterways
- E11 Environmental Risk Assessment

9. OEMP Supporting Documents

Appendix 1 – Planning Conditions of Approval relevant to the Maintenance Period

Appendix 2 – List of Environmental Legislation

Appendix 3 – Summary of Deed Environmental Document Requirements for Maintenance

Appendix 4 – Sensitive Area Plans

Appendix 5 – The EMP Checklist

Appendix 6 – Soil and Water Management SubPlan

Appendix 7 – Heritage Management SubPlan

Appendix 8 – Waste and Reuse Management Subplan

Appendix 9 – Template for EA for Tree Trimming

OEMP Appendix 1 Conditions of Approval and Concurrence Conditions relevant to the Maintenance / Operational Period

Department of Planning

Reference and Issue	Addressed	Details	Timing
Condition 27 Operational Noise	Report Complete during construction stage.	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 DG for the Report prior to construction commencing or within any other time agreed to by the DG. The report and investigation must be conducted in accordance with the NSW Government's ECRTN and the RTAs ENMM. The report and investigation must include a discussion of points (a) to (h). The Proponent must install all reasonable and feasible noise mitigation measures identified in the Operation Noise Management Report.	
Condition 15 EMP (O)	Section 1.	<p>An EMPO shall be prepared prior to the commencement of operation. The plan shall be prepared in consultation with the EPA, DLWC, NSW Fisheries, NPWS and Byron Shire Council and any other relevant government agency nominated by the DG. The Plan shall be prepared in accordance with the conditions of this approval, all relevant Acts and Regulations and accepted best practice management procedures. The EMP (Operational Stage) shall require approval by the DG prior to commissioning or within such time as otherwise agreed to by the Director General. The EMP shall be certified as being in accordance with the conditions of approval by the EMR prior to seeking approval of the DG. The OEMP shall address at least the following:</p> <ul style="list-style-type: none"> (i) identification of the statutory and other obligations which the proponent is required to fulfil, including all licences/approvals and consultation/agreements required from authorities and other stakeholders and key legislation and policies which control the proponent's operation of the project. (ii) Sampling strategies and protocols to ensure the quality of the monitoring program including specific requirements of the EPA and DLWC (iii) 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. (iv) Steps the proponent intends to take to ensure compliance with all plans and procedures (v) Consultation requirements including relevant government agencies, the local community and council and complaints handling procedures (vi) Strategies for the main environmental system elements and including but not limited to noise and vibration, water, land slip/settlement, air quality, erosion and sedimentation, access and traffic, property acquisition and/or adjustments, heritage and archaeology, groundwater, contaminated spoil, waste/resource management/removal/disposal, flora and fauna, hydrology and flooding, visual screening, landscaping and rehabilitation, hazards and risks, energy use, resource use and recycling and utilities. <p>Specific requirements for some of the main environmental system elements referred to in (iv) shall be as detailed under the conditions of this approval and/or as required under any licence or approval.</p> <p>The EMP(O) shall be made publicly available. All sampling strategies and protocols undertaken as part of the EMP(O) shall include a quality assurance/quality control plan and shall be approved by the relevant regulatory agencies to ensure the effectiveness and quality of the monitoring program. Only accredited laboratories can be used for analysis.</p>	

Reference	Addressed	Details	Timing
Condition 16 Environmental Impact Audit Report	Section 4.4	An EIAR shall be submitted to the DG and the EPA and upon request by the DG to any other relevant government authority 12 months after commissioning of the project or unless otherwise agreed by the DG and at any additional periods thereafter as the DG may require. The technical studies required as part of the report shall be prepared by appropriately qualified, independent specialists. The Report shall assess the key impact predictions made in the EIS and any supplementary studies and detail the extent to which actual impacts reflect the predictions. In particular, the Report shall provide details on actual versus predicted noise and vibration impacts on local residences and nearby buildings, flora and fauna mitigation measures, geotechnical issues (including land slip) and all other key impact issues identified in the EIS. The suitability of implemented mitigation measures and safeguards shall also be assessed. The report shall also assess compliance with the EMP (O). The report shall be made publicly available.	
Condition 17 Soil and Water management sub plan	Appendix 6.	As part of the EMP(O) a SWQMSP shall be prepared to the satisfaction of the EPA and DLWC and in consultation with NSW Fisheries and Byron Shire Council. NPWS shall be consulted in relation to specific water quality control measures to be implemented in the vicinity of wetland areas. The sub plan shall be prepared in accordance with the Dept of Housings guideline and where appropriate DLWCs Constructed Wetlands Manual. The Sub plans shall be prepared prior to operation and provide details of pollution control measures, including measures to treat and dispose of water from the site and water quality monitoring to be undertaken during the operation stage.	
Condition 21 Operation Stage Control Measures	Appendix 6.	All stormwater drainage, erosion, sedimentation and water pollution control systems and facilities of the proposal shall be operated and maintained to meet the reasonable requirements of the relevant authorities including the EPA and DLWC and in consultation with NSW Fisheries. All facilities including wetland filters, grass filter strips, gross pollutant traps and sedimentation basins shall be inspected regularly and maintained in a functional condition for the life of the project by the Proponent unless the responsibilities are transferred to other parties with the approval of the EPA.	
Condition 22 Operation Stage Control	Shown on Drainage Drawings and Appendix 6.	The proponent shall provide appropriate detention systems for containment of spills and materials arising from accidents and install appropriate detention systems to the satisfaction of the EPA. Lockable shut off valves shall be provided at all points that discharge directly to natural watercourses.	
Condition 34 Operation Noise	Section 3.7	Monitoring of the noise when operational shall be undertaken as part of the Noise and Vibration Management Sub Plan. The Proponent shall in consultation with the EPA, assess the adequacy of the traffic noise mitigation measures. Should the assessment indicate a clear trend in traffic noise levels which are higher than the predictions made and exceed EPA noise goals, the Proponent shall ensure the implementation of further noise mitigation measures such as consideration of open grade asphalt road pavement, inclusion and/or heightening of noise barriers, insulation of buildings, partial or total acquisition of properties or any other measure as agreed to by the EPA. Notwithstanding the above, the Proponent shall ensure compliance with the noise assessment criteria as described in the EIS unless otherwise approved by the EPA.	
Condition 45 Flora and Fauna	Section 3.5	All landscaping works undertaken outside the road reserve shall be monitored and maintained by a suitably qualified landscape specialist for a period of not less than three years from commissioning of the road unless otherwise agreed with relevant landowners. All costs of such monitoring and maintenance shall be borne by the Proponent. Landscaped areas within the road reserve shall be maintained at all times.	
Condition 46 Indigenous Heritage	Appendix 7	As part of the EMPO the Proponent shall prepare an Indigenous Heritage Management Sub Plan. The Sub Plan shall identify archaeological items and present management options. In the preparation of the Sub Plan, the Proponent shall consult with Byron Shire Council, NPWS and the Tweed Byron Local Aboriginal Land Council.	
Condition 50	Appendix 7	As part of the EMPO the Proponent shall prepare a Non-Indigenous Heritage Management Sub Plan. The Sub Plan shall identify heritage items and present management options. In the preparation of the Sub Plan, the Proponent shall consult with any local historical societies,	

Reference	Addressed	Details	Timing
Non-indigenous Heritage		relevant heritage authorities and Byron Shire Council.	

Reference	Addressed	Details	Timing
Condition 61 Waste Management	Appendix 8	As part of the EMPO a detailed Waste Management and Reuse Sub Plan shall be prepared to the satisfaction of the EPA. The Sub Plan shall address the management of wastes during the operation stage. It shall identify requirements for: waste avoidance, reduction, reuse, recycling and details of requirements for: handling, stockpiling, disposal of wastes: specifically soil or water, concrete, demolition material, cleared vegetation, oils, grease, lubricants, sanitary wastes, timber, glass, metal etc and identify any site for final disposal of any material and any remedial works required at the disposal site before accepting that type of waste.	

DEC (NPWS) Concurrence Conditions

Reference	Addressed	Details	Timing
Condition 10 Weed management	Completed in construction phase, and Section 3.5	Undertake a survey to determine the extent of weed infestation in areas within and immediately adjacent to the road corridor. Prepared a Weed Management Strategy which is to be included in the EMP, addressing weed management during both construction and <i>on-going operation</i> of the road.	
Condition 14 Fauna monitoring	Section 3.5	Develop a program for the long term monitoring of the impact of the upgrade on flora and fauna including details on methods, monitoring of road kills, and effectiveness of flora and fauna mitigation measures. This program must be for a minimum period of 3 years after completion of works with on-going monitoring after that time being subject to review between RTA and the Manager Northern Zone NPWS	

Byron Shire Council Conditions

Reference	Addressed	Details	Timing
Condition 8 Monitoring Flora and Fauna	Section 3.5	A three year minimum term monitoring of flora and fauna mitigation measures shall be undertaken. Details of the monitoring plan are to be prepared in consultation with the National Parks and Wildlife Service and submitted to Byron Shire Council.	

OEMP Appendix 2 NSW Environmental Legislation

NSW Act	Requirements
Environmental Planning and Assessment Act (1979) and Regulation (2000)	This Act institutes a system for environmental planning and assessment including approvals and environmental impact assessment for proposed developments. The Brunswick Heads to Yelgun Pacific highway Upgrade is a deemed 3A project.
Fisheries Management Act (1995) and Regulation (1994)	<p>The major objective of this Act is to conserve, develop and share the fishery resources of the state for the benefit of present and future generations. This includes conservation of aquatic biodiversity, threatened species, populations, ecological communities and critical habitats of fish and marine vegetation. NSW Fisheries must be contacted before any dredging activity is undertaken to remove obstructions from waterways.</p> <p>A permit from DPI (Fisheries) may be required for the removal of sediment or obstructions from a waterway, impacts on a creek or river bank, temporary or permanent blockage of fish passage, or disturbance to mangroves or marine grasses.</p>
National Parks & Wildlife Act (1974) and Regulation	<p>This Act relates to the protection of fauna, native plants, and Aboriginal sites and relics.</p> <p>A permit may be required to damage an aboriginal relic.</p>
Threatened Species Conservation Act (1995)	<p>This Act regulates the protection of threatened flora and fauna as listed in the Schedules to the Act as either endangered or vulnerable.</p> <p>A License may be required from DEC for the trimming or impacting in any way a Threatened flora Species.</p>
Waste Avoidance and Resource Recovery Act (2001)	This Act relates to the management and reduction of waste including the consumption of natural resources and final disposal of wastes. It also ensures environmentally responsible transporting, reprocessing and handling of wastes.
Rivers and Foreshores Improvement Act (1948)	This Act relates to the prevention of erosion of land by waters and controls activities within 40 metres of rivers, lakes and foreshores. Public authorities including the RTA, are exempt from requiring a permit under this Act.
Noxious Weeds Act (1993)	This Act provides for a coordinated approach to the control of weeds in NSW. The Act requires private occupiers, public authorities, corporations and local Councils to control noxious weeds on land under their management. It also empowers local Councils to give notice to undertake appropriate control according to the specified category.

Rural Fires Act (1997)	The object of this Act is to prevent, mitigate and suppress bush and other fires. The Act establishes a duty to prevent the occurrence of bush fires and to minimise the danger of spread of bush fires.
Pesticides Act (1999)	The major objectives of this Act are to promote the protection of human health, the environment, property and trade in relation to the use of pesticides, having regard to the principles of ecologically sustainable development within the meaning of the Protection of the Environment Administration Act 1991 and to minimise risks to human health, the environment, property and trade. The Act included provisions for recording details of herbicide use.
Protection of the Environment Operations Act (1997)	<p>This Act relates to the prevention, minimisation and abatement of pollution of waters, noise and vibration impacts, air pollution from all premises/mobile industries, plants, motor vehicles, and the disposal of waste to land. The Act applies to activities such as noise and air emissions, control of runoff, management of materials (e.g. fuel, chemicals, wastes) and the quality of effluent discharged.</p> <p>The PoEO Act replaced the Clean Air Act 1961, the Clean Waters Act 1970, the Environmental Offences and Penalties Act 1989, the Noise Control Act 1975, the Pollution Control Act 1970, and the major regulatory provisions of the Waste Minimisation and Management Act 1995.</p> <p>The Act has three tiers of environmental protection offences such as for unlawful waste disposal, spillage's, discharges etc. and creates penalties for individuals and companies for contraventions of this Act.</p> <p>The Act provides general enforcement processes such as the issue of clean-up notices, prevention notices and prohibition notices by the DEC or local Council. The Act also includes a duty to notify the appropriate regulatory authority (DEC or council) of pollution incidents where material harm to the environment is caused or threatened.</p>
Ozone Protection Act (1989) and Regulation	This Act regulates and prohibits the use, emission, storage and disposal of stratospheric ozone depleting substances and articles which contain those substances.
Contaminated Land Management Act (1997) and Regulation	This Act promotes the better management of contaminated land and establishes a process for investigating, and where appropriate remediating, land where contamination presents a significant risk of harm to human health or some aspect of the environment. In managing contaminated land it is necessary to comply with the requirements of this Act.
Environmentally Hazardous Chemicals Act (1985) and Regulation	<p>This Act controls the use and handling of specific chemicals and disposal of chemical wastes to control the effect on the environment. Under the Act, an inventory of chemicals which can be used in NSW is created. It is an offence to use or receive any chemical not on the inventory.</p> <p>The DEC can also declare substances to be chemical wastes. The authority can then issue "chemical control orders" which regulate the disposal of these wastes. A register of all chemical wastes and chemical control orders is kept by the DEC.</p> <p>The use, storage, transportation and disposal of all chemicals and chemical wastes should meet the requirements of this Act.</p>

<p>Dangerous Goods Act (1975) and Regulation</p>	<p>Under this Act a premises must be licensed for the keeping of explosives or other dangerous substances as prescribed under the Act and Regulation. A licence must be obtained for the storage of dangerous goods.</p> <p>The Dangerous Goods Act creates a criminal offence for endangering life, causing injury or damaging property as a result of negligence or careless transportation, handling or storage of dangerous goods.</p>
<p>Local Government Act (1993)</p>	<p>The main purposes of this Act are to provide the legal framework for an effective, efficient, environmentally responsible and open system of local government in New South Wales, regulate the relationships between the people and bodies comprising the system of local government in New South Wales and to require Councils, Councilors and council employees to have regard to the principles of ecologically sustainable development in carrying out their responsibilities.</p> <p>This Act will be relevant to maintenance issues involving local traffic management, waste disposal and building approvals.</p>
<p>Water Management Act (2000)</p>	<p>The main objectives of this Act are to provide for the sustainable and integrated management of the water sources of the State for the benefit of both present and future generations and, in particular to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality, and to integrate the management of water sources with the management of other aspects of the environment, including the land, its soil, its native vegetation and its native fauna.</p> <p>Water extraction from a fresh water creek may require a license/permit from DNR.</p>
<p>Heritage Act (1977)</p>	<p>This Act relates to the conservation of items of heritage. Approvals from the Heritage Office are required to demolish/damage/remove/alter an item of heritage.</p>
<p>Native Vegetation Conservation Act 1997 and Native Vegetation Act</p>	<p>The main objectives of these Acts are to provide for the conservation and management of native vegetation on a regional basis, to encourage and promote native vegetation management in the social, economic and environmental interests of the State, and to protect native vegetation of high conservation value. Clearing of native vegetation may require a permit from DNR.</p>

OEMP Appendix 3 Summary of Deed Environmental Document Requirements for Maintenance

Reference	Addressed in OEMP	Details
Project Deed	Section 1, 2 and 3.3	<p>Section 2.4 (Environmental Requirements) (a) and (c) requires the contractor to carry out the Maintenance Work in:</p> <ul style="list-style-type: none"> (i) an environmentally responsible manner so as to protect the environment (ii) in accordance with the environmental documents, environmental plans and all relevant Law. <p>The contractor must immediately notify the RTA in writing of any breach or potential breach or non-compliance or potential non-compliance with the conditions or requirements of any of the environmental documents or any Law regarding the contractors maintenance work.</p>
QA Specification DCMG36 Environmental Protection (Management System)	Section 5.5	<p>This Specification requires compliance with operational controls including the provision of goods/services, management of subcontractors, handling and storage of materials, disposal of wastes and incident management.</p> <p>Within 28 days after the issue of the Certificate of Construction Completion, an environmental compliance audit, including site inspection and full review of environmental records, be carried out. The audit would identify any environmental protection measures which have not yet been finalised. The condition of environmental protection controls shall be recorded and controls which need ongoing management will be itemised. The audit report is required to be submitted to the RTA's representative together with a written response on how all actions and issues raised in the audit will be addressed.</p>
Appendix 7 UDLP	Landscape Maintenance Report	Section 7.5.3 requires that a landscape management report be prepared for the maintenance phase of the project. This report is included in the Maintenance Manual.
Appendix 4 Additional Environmental Requirements	Completed in construction phase, and Section 3.7	Clause 4.20 (Operation Noise Management Report) requires the preparation of an operation noise management report which includes a noise study on the contractors design. The study must use the input variables identified in Appendix 20 and contain the details identified in (a) to (p).
Appendix 24 SWTC	Section 3.3	Section 24.1.2 (Reports on maintenance work) requires that from the date of construction completion until the date of final completion the contractor must provide a report on a three monthly basis to the RTAs rep and project verifier by the seventh day of the following month in such format is required by the RTA rep containing or setting out (a) to (s) (m) a report on performance against the requirements of the EMP including monitoring and testing outcomes, air and water discharge quality, community issues (including the community and complaints register) and the status of compliance with environmental documents.

Reference	Addressed in OEMP	Details
Environmental Impact Assessment of a Modification (Exhibit T of the Deed)	Permanent marker pegs retained. Appendix 6, 7 and 8, and the Maintenance Manual.	Section 7.1 Table 4 (Flora and Fauna) requires that the CB fence be retained using permanent markers after construction to ensure that future maintenance activities, such as bridge inspections, slashing and weed control will not encroach into SEPP 14 66C. Section 7.2 (Environmental Management) requires the EMPs (including the OEMP) to include sub-plans that manage impacts on soil and water quality, noise and vibration, flora and fauna, urban design and landscaping, indigenous and non-indigenous heritage, air quality, traffic and access, spoil disposal and waste management, property and land use, utility and service adjustments, concrete batching plants and cumulative effects.
Environmental Impact Assessment Decision Report (Modification) (Exhibit G of the Deed)	Section 4, 5 and 6 Section 3.7	Section 2 (Compliance System) requires the EMP to incorporate all environmental mitigation measures, controls and commitments for the project, following approval to the Modified Proposal. An electronic compliance system shall be developed to monitor compliance with all project obligations during detailed design, construction and operation. Section 7 (Noise) requires an operational noise assessment to be commenced within 6 months of commissioning of the proposal to assess traffic levels/composition in relation to compliance against Environmental Criteria for Road Traffic Noise.
Review of Environmental Factors – BHNR Access Road (Exhibit I of the Deed)	Section 3.5	Section 7 Once construction is complete, the NPWS will be responsible for the on-going maintenance of all work carried out within the nature reserve.
Review of Environmental Factors – Yelgun Rest Area (Exhibit S of the Deed)	Section 3.7	Section 7.1 Table 7 (Noise and Vibration) requires the preparation of an Operational Noise Management Report that would form part of the Noise and Vibration Management Plan in the CEMP. It would require monitor operational noise once the proposed facility was open to traffic and assess the accuracy of traffic noise predictions in this REF. It would also identify noise monitoring and complaint response procedures. Should the report indicate a clear trend in traffic noise levels that are higher than the predictions made in this REF, investigate additional operational noise mitigation measures following the guidelines I the RTA ENMM.
Submissions Report (Exhibit J of the Deed)	Section 3 of Soil and Water Man't Sub Plan	Section 6 (Conclusions) requires that some protective measures implemented during construction would be retained for use during operation. *(NOTE: refer Table 15.1 of the EIA or Table 6.1 of Exhibit J for full details)

Reference	Addressed in OEMP	Details
Representations Report (Exhibit N of the Deed)	Section 1.5 Section 2.2 Section 5 Section 5 and Soil and Water Subplan Section 4 Section 3.7 SOP-E10 and S&W Subplan section 4	Section 8 Draft Recommended CoA (d), (e) and (f) requires: <ul style="list-style-type: none"> ○ An OEMP to be prepared prior to the commencement of operation. The Plan will be prepared in consultation with the EPA, DLWC, NSW Fisheries, Byron Shire Council and any other relevant government agency nominated by the DG. ○ The OEMP to be prepared in accordance with the CoA, all relevant acts and regulations and accepted best practice management procedures. ○ The OEMP to include details of monitoring, inspection and test plans for all activities, maintenance requirements, consultation requirements during operation. Section 8.2.4 Monitoring (a), (d), (e), (f), (g) requires: <ul style="list-style-type: none"> ○ The performance of mitigation measures for air, noise, visual impacts, sediment (including aquatic sediment) and other impacts to the biophysical environment to be monitored to ensure that they are functioning correctly, according with predictions and to determine whether any further action is required. ○ Water quality monitoring of pH and DO to be included during construction. During the operational phase, when exposed surfaces are stabilised, including the remediation of any possible ASS problems, pH will only be periodically monitored as a precautionary measure. ○ Noise monitoring to be conducted after the proposal is open to traffic. Monitoring of noise levels will be undertaken at representative residential sites. At least one site representative of the southern Stock Route Road area will be included in this program. ○ Pile stubs (the cut off base of the demolished bridge) to be monitored annually for a period of 3 years. Further demolition of the piles will be carried out as necessary with appropriate assessment. ○ Data collected by the BR Oyster Growers Committee to be used for long term monitoring.
Species Impact Statement and Addendum (Exhibit O of the Deed)	SW Subplan Section 3. Section 3.5 SW Subplan Section 4. Section 3.5	Section 12.1 requires the OEMP to include specific amelioration measures as per Table 17.2 of the EIS. Section 12.1.3 requires: <ul style="list-style-type: none"> • Implementation of a water quality control and stormwater management program to ensure that any discharges which arise from the road system are of an appropriate quantity and quality in the long term • Treatment of water derived from the construction and operation of the road to avoid the discharge of contaminants or nutrients into plant species of conservation significance or into their habitats. Section 12.3 requires the OEMP to provide: <ul style="list-style-type: none"> • details of measures to provide long-term protection for the natural environment • long term and short term protocols and measures as well as details of measures to minimise fauna road mortalities. Section 12.3 (Long Term Strategies) requires: <ul style="list-style-type: none"> • Implementation of a monitoring program as part of an overall monitoring regime along the PH. I.e monitoring of the effectiveness of fauna underpasses and other wildlife management activities. • monitoring of the efficacy of fauna underpasses

Reference	Addressed in OEMP	Details
Environmental Impact Statement (Exhibit P of the Deed)	SW Subplan Section 3 SW subplan Section 4 Section 3.5	Section 17.2.1 requires the EMP to outline a checklist of actions to ensure that the environment is protected during the operational phase. An outline of the EMP is detailed in Table 17.2: Table 17.2 (Post Construction) requires that: <ul style="list-style-type: none"> • Monitoring and management activities be undertaken in accordance with the OEMP • Monitoring stormwater drainage outlets be undertaken for evidence of stream sedimentation • Monitoring water quality of receiving waters for evidence of pollution (objective: maintain surface water control measures and monitoring of water discharges until such time as landscape works are effective) • Quality of runoff from stormwater drainage outlets to be monitored to ensure compliance with DEC requirements as provided in the Licence and in accordance with the sediment control plan • Sediment traps to be retained after construction ceases until restoration works such as landscape treatments have become effective. • Conduct post construction monitoring and necessary action in accordance with the DEC traffic noise objectives.

OEMP Appendix 4 Sensitive Area Plans

The Sensitive Area Plans for the Brunswick Heads to Yelgun project site contain information that is considered sensitive, and for this reason are confidential and not publicly available.

OEMP Appendix 5 EMP Checklist

The following checklist will be completed on a 6 monthly basis by the Maintenance Manager. Completion of the checklist will require a full review of all relevant records (inspection documentation, checklists, maintenance record sheets) to verify that inspections are being undertaken as scheduled and that any environmental issues are being identified.

Reference	Commitment	EMP Checklist Action Required	Timing	✓
Section 2 – Environmental Obligations Appendix 1	Implement Dept of Planning and Concurrence Conditions of approval.	Audit and track compliance and the progress of implementation with the requirements identified in Appendix 1.	6 monthly during the maintenance period	
Section 2.2 – Legal and Regulatory Requirements See also Appendix 2 and 3	<p>Activities to comply with relevant NSW statutory requirements.</p> <p>Activities to be implemented in accordance with the Project Deed.</p> <p>All relevant state agency approvals to be sought and obtained for maintenance works.</p>	<p>Review Appendix 2 to identify any upcoming approval requirements.</p> <p>Reporting to the DEC on the Environmental Protection Licence until agreement with DEC on when the Licence can be relinquished</p> <p>Track compliance and/or the progress of implementation with the requirements identified in Appendix 3.</p> <p>Review approval/permit conditions and track compliance.</p> <p>Identify upcoming approval requirements.</p>	<p>At all times during the maintenance period.</p> <p>Monthly reporting</p> <p>6 monthly during the maintenance period.</p> <p>6 monthly during the maintenance period</p>	
Section 2.4 – Environmental Sub Plans See also individual sub plans in Appendix	Comply with the requirements of each sub plans.	Audit and track compliance with the requirements contained in each sub-plan.	6 monthly during the maintenance period	
Section 3.2 – Induction and Training	<p>All personnel, key subcontractors and consultants to be inducted.</p> <p>Provide specific training to personnel.</p>	<p>Review induction and training records.</p> <p>Review and update induction material.</p> <p>Prepare toolbox training to ensure ongoing skill development.</p>	<p>annually during the maintenance period</p> <p>Every 2 years or as required.</p> <p>6 monthly and prior to any new work activity.</p>	

Reference	Commitment	EMP Checklist Action Required	Timing	✓
Section 3.3 – Communication and Consultation	Attend Project Control Group meetings.	Review meeting minutes to ensure all items have been actioned and closed.	6 monthly during the maintenance period	
	Maintain complaints register.	Review complaints register to ensure all complaints have been closed out.	6 monthly during the maintenance period	
Section 3.4 – Emergency Response and Preparedness	Implement emergency preparedness measures.	Inspect storage areas and arrange 'housekeeping' if required.	6 monthly during the maintenance period	
		Update MSDS register.	6 monthly during the maintenance period	
		Check emergency stocks.	6 monthly during the maintenance period	
		Update emergency contact lists and circulate as required.	6 monthly during the maintenance period	
Section 5 – Compliance and Evaluation of the EMP	Review the implementation and effectiveness of the EMPO.	Complete this checklist and follow up any outstanding items.	6 monthly during the maintenance period	
		Review audit schedule and plan audits for the upcoming 6 months.	6 monthly during the maintenance period	
		Monitor the implementation of selected SOPs to check compliance.	6 monthly during the maintenance period	
		Review non-conformances and close out.	6 monthly during the maintenance period	
Section 6 – Review and Improvement	Review and Update the EMP	Undertake a full review of the EMP, SPs and SOPs.	12 months after commencement of operation then every 2 or 3 years	
Section 7 – Records Management	Maintain records of environmental maintenance and monitoring activities.	Audit environmental record keeping processes and ensure all records are up-to-date and organised.	6 monthly during the maintenance period.	

Date:

Completed by:

Follow up required: YES NO ATTACH DETAILS OF ACTION TAKEN

OEMP Appendix 6 Soil and Water Management SubPlan

OEMP Appendix 7 Heritage Management SubPlan

OEMP Appendix 8 Waste and Reuse Management Subplan

OEMP Appendix 9 Template for EA for Tree Trimming