Roads and Traffic Authority of NSW

Oxley Highway to Kempsey
Upgrading the Pacific Highway

Environmental Assessment

MAIN VOLUME

September 2010

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ISBN: 978-1-921766-49-7

PART D – JUSTIFICATION AND CONCLUSION

21. Principles of ecologically sustainable development

The Director-General's environmental assessment requirements identify a number of key issues to be addressed as part of the justification of the Proposal, including ecologically sustainable development. **Table 21-1** indicates where the aspects of the Director-General's environmental assessment requirements that relate to justification of the Proposal are addressed, either in this chapter or in other chapters (in **italics**).

Table 21-1 Principles of ecologically sustainable development

Environmental assessment requirements	Where addressed
Strategic Justification and Project - outline the strategic outcomes for the Pacific Highway Upgrade Program (PHUP), including with respect to strategic need and justification, the aims and objectives of relevant State planning policies, the principles of Ecologically Sustainable Development, and cumulative and synergistic impacts associated with the Program as a whole. Identify how the project fits within these strategic outcomes and how impacts associated with the project will be considered and managed to achieve acceptable environmental planning outcomes across the PHUP.	*Chapter 2 Strategic need for the Proposal* *Chapter 3 Proposal need, objectives and alternatives* *Chapter 10 Land use and property* **Sections 21.1**, **21.2**, **21.3** and **21.4** *Chapter 22 Strategic and Proposal justification*

In accordance with the *Protection of the Environment Administration Act 1991*, ecologically sustainable development requires the effective integration of economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following four principles:

- The precautionary principle.
- Inter-generational equity.
- Conservation of biological diversity and ecological integrity.
- Improved valuation, pricing and incentive mechanisms.

This chapter of the Environmental Assessment defines these principles and describes how they have been applied to the Proposal.

21.1 Precautionary principle

The *Protection of the Environment Administration Act 1991* defines the precautionary principle as *"if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation"*.

Further, the Act states that, in applying the precautionary principle, decisions should be guided by:

- Careful evaluation to, wherever practicable, avoid serious or irreversible damage to the environment.
- An assessment of the risk-weighted consequences of various options.

The precautionary principle has played a key role in the development of the Proposal, from the route option identification and assessment process through to the concept design and the environmental assessment. Appropriate information was obtained for each phase of the development process to allow potential impacts to be identified, an informed assessment process to be undertaken and appropriate management measures to be developed. This includes:

- Developing the Proposal using a number of different phases of investigation, consultation and assessment to ensure that on balance the most appropriate route and route alignment was selected. Those phases were:
    - A route options development phase, which included preliminary environmental, cultural, engineering, economic and social investigations of the Proposal area, as well as some targeted investigations. Constraints mapping was also undertaken. Four feasible options were identified and placed on exhibition for public comment.
    - A preferred route selection process, which included a detailed review of public submissions, consultation with affected landowners, value management workshop and further investigations and options refinement.
    - Concept design development, which further refined the preferred route based on detailed investigations of a number of environmental and social issues associated with the preferred route.
    - Environmental assessment, which built on earlier investigations and consultation. This assessment also took account of the Director-General's environmental assessment requirements and informed field investigations.
- Undertaking an environmental risk analysis to ascertain whether aspects of the Proposal required a higher level of study than that required by the Director-General's environmental assessment requirements. The environmental risk analysis confirmed the level of assessment required, and facilitated the adoption of the precautionary approach for the environmental assessment and the concept design phases.
- Selecting and adjusting the alignment of the Proposal to avoid or minimise:
    - Vegetation clearing within sensitive areas, including state forests, endangered ecological communities, State listed wetlands and national park areas.
    - Potential impacts on threatened flora and fauna, as well as key habitat areas.
    - Potential impacts on known items or areas of Aboriginal cultural significance.
- Identifying possible constraints on the Proposal associated with soil conditions such as acid sulfate soils, and the identification of appropriate management measures for application where these conditions are encountered.
- Undertaking detailed sub-surface investigation of Aboriginal potential archaeological deposit sites to better define the risk of impacting significant Aboriginal sites in these areas. This, and all earlier Aboriginal site investigations, involved extensive consultation with the local Aboriginal community, DECCW and the NSW Heritage Office to help define the risks and the management measures required.
- Developing management measures for threatened flora and fauna species and endangered ecological communities in known or potential habitat areas identified during field investigations. This has included measures such as the provision of dedicated fauna crossing structures and extending the watercourse crossing lengths to avoid impacts on mangroves and seagrass habitats at the Hastings and Wilson river crossings.

- Minimising potential impacts on existing residential properties and other land uses, while also taking into consideration potential impacts on proposed future land use activities such as the development of Area 13 Thrumster and the Sancrox Road industrial area.
- Undertaking extensive community consultation throughout the development process for the Proposal. This was aimed at identifying the potential environmental and social issues so that they could be assessed and management measures developed to address these issues where necessary.

21.2 Intergenerational equity

The *Protection of the Environment Administration Act 1991* defines intergenerational equity as the present generation ensuring that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.

The Proposal would provide a number of benefits to current and future generations of local communities and the surrounding region that would maintain or enhance the health, diversity and productivity of the environment. This includes:

- Selecting a Preferred Route Corridor that minimises vegetation clearance within sensitive ecological areas, ensuring that such areas are conserved for future generations.
- Including water quality, fauna connectivity and hydrological management measures into the Proposal to ensure that the impacts on the distribution of flora, fauna and ecological communities within sensitive ecological areas and other areas of terrestrial and aquatic habitat are minimised both for the short and long term. Provision of fauna crossing structures would also reduce fauna mortalities.
- Including a package of compensatory habitat or offset measures to be developed in consultation with DECCW and DII to mitigate against the residual impacts after the application of the proposed management measures for the Proposal.
- Detailing management measures and monitoring programs for the construction and operation phases of the Proposal to help control and minimise the potential for long-term environmental and social impacts that could arise during these phases.
- Consulting with DECCW and the local Aboriginal community throughout the route selection process and the environmental assessment phase to minimise the potential for irreparable damage to Aboriginal cultural heritage during construction. This included the consideration of measures to maintain access to landform features such as the ochre site in the Sancrox Road area. Ongoing involvement of DECCW and the local Aboriginal community during the construction phase would further reduce the potential for damage to Aboriginal cultural heritage.
- Ensuring that the development and assessment of the Proposal considered not only existing residential properties and land uses, but also potential impacts on potential future land use activities adjacent to the road reserve such as industrial estates and urban expansion.
- Improving traffic flow, and the resulting reduction in fuel consumption compared to the existing highway, which is expected to provide short-term and long-term improvements in air quality in the surrounding area. The estimated greenhouse gas emission savings from operation of the Proposal would exceed the greenhouse gas emissions generated during construction approximately 15 years after opening.

- Reducing travel times, costs and crash risk for future generations through traffic flow and safety improvements. The objectives of the Pacific Highway Upgrade Program would be met (refer to **Section 2.1**), and economic benefits in the form of freight efficiency and development potential for surrounding areas would be provided.
- Providing ongoing improvements to the amenity and safety for the communities of Telegraph Point and Kundabung through the incorporation of bypasses, as well as improved connectivity and access to these communities, which would provide opportunities to enhance their built environment.

21.3 Conservation of biological diversity

The *Protection of the Environment Administration Act 1991* states "*conservation of biological diversity and ecological integrity should be a fundamental consideration*".

Biological diversity is defined by the TSC Act as "*the diversity of life and is made up of the following three components*:

"(a) Genetic diversity - the variety of genes (or units of heredity) in any population,

(b) Species diversity - the variety of species,

(c) Ecosystem diversity - the variety of communities of ecosystems."

Ecological integrity is not defined by any Australian legislation. However, ecological integrity is defined by the Canada *National Parks Act 1974* as "*a condition that is determined to be characteristic of its natural region and likely to persist, including abiotic components and the composition and abundance of native species and biological communities, rates of change and supporting processes*".

Conservation of the biological diversity of the local area has been a key consideration during the route identification and selection process, the concept design development and the environmental assessment phase. This includes:

- Identifying and mapping in the initial phases of the route selection process areas of known high biodiversity significance, including national parks, state forests and other conservation reserves, State listed wetlands, mangroves and seagrass beds, areas of threatened species habitat, potential endangered ecological communities and mapped fauna movement corridors. This information was confirmed from existing vegetation community mapping, DECCW databases and subsequent field surveys, and formed a key component of the route selection process.
- Undertaking further detailed field surveys during the concept design and environmental assessment phase to determine the potential impacts of the Proposal. This facilitated the amendment of the concept design to minimise potential impacts and allowed for the development of appropriate management measures to mitigate against those impacts.
- Developing and implementing an urban design and landscape strategy based on the use of locally endemic flora, and a range of management measures to be implemented as part of the Proposal to ensure that biological diversity in the local area and the region is maintained, and where possible, enhanced.
- Incorporating design features into the Proposal such as fauna fencing and crossing structures that would facilitate safe movement patterns for native fauna species and maintain current fauna movement corridors.

- Establishing site selection criteria for construction site facilities that include a preference for already cleared or disturbed areas to minimise native vegetation clearing.
- Proposing a number of management measures as summarised in **Appendix B** to be implemented prior to, during and following construction, and continuing in the operation phase, with the purpose of minimising impacts on native fauna species, and therefore maintaining biological diversity.
- Designing bridges and other watercourse crossings to locate and minimise the footprint of bridge piers and abutments to minimise disturbance of riparian vegetation, as well as river and creek beds. This would include minimising the impacts on mangroves and seagrass beds at the Hastings and Wilson river crossings.
- Detailing a range of management measures to minimise the potential impact of the Proposal across a range of environmental aspects such as noise, air, water quality and waste management that would also play an important role in the protection of the biological diversity and ecological integrity of the area.
- Considering the cultural significance to the local Aboriginal community of the remaining areas of native vegetation and the maintenance of the existing biological diversity of the area.
- Including a biodiversity offset package to be developed in consultation with DECCW and DII to mitigate any residual impacts of the Proposal.

21.4 Improved valuation and pricing of environmental resources

The *Protection of the Environment Administration Act 1991* states that environmental factors should be included in the valuation of assets and services. The Act identifies that the following can help achieve this:

- Polluter pays – those who generate pollution and waste should bear the cost of containment, avoidance or abatement.
- The users of goods and services should pay prices based on the full life cycle of costs of providing goods and services, including the use of natural resources and assets and the ultimate disposal of any waste.
- Environmental goals, having been established, should be pursued in the most cost effective way, by establishing incentive structures, including market mechanisms that enable those best placed to maximise benefits or minimise costs to develop their own solutions and responses to environmental problems.

The economic values of environmental resources affected by the Proposal have been taken into account throughout the route selection process, the concept design development and the environmental assessment phase. This includes:

- Considering environmental issues in the route selection process.
- Costing the management measures required to minimise potential impacts on the environment into the costing of the Proposal.
- Considering the potential economic impacts on affected property owners including the reduced viability of farming activities due to the loss of land, division of properties and changes in access and property management practices associated with the Proposal.

- Recognising the economic value of state forests and ensuring that the area of state forest land directly affected by the Proposal or isolated from the main section of the state forest estate is minimised.
- Considering the potential impacts on the economic viability of the local aquaculture industry and tourism, as a result of potential water quality impacts, and the inclusion of specific management measures to avoid or minimise any potential impacts.
- Costing the inclusion of monitoring programs to ensure that the valuable environmental resources of the area are protected, and that any unexpected impacts are identified and suitable management measures can be developed and implemented.
- Including a biodiversity offset package to be developed in consultation with DECCW and DII to mitigate any residual impacts of the Proposal, in addition to a range of other biodiversity management measures.
- Acknowledging that the RTA and its construction contractors would be responsible for costs associated with the appropriate management of waste generated during construction of the Proposal.

21.5 Summary

The Proposal has considered the principles of ecologically sustainable development throughout the route selection, preferred route development and concept design phases. Design decisions have been made with the aim of defining elements of the Proposal so that environmental impacts would be minimised. This has included amending route options to avoid environmentally sensitive areas and reducing impacts on agriculturally productive lands.

The Proposal would also meet the requirements of the four principles of ecologically sustainable development through the implementation of environmental management measures and appropriate offsets developed in consultation with the required regulatory agencies.