Part D
Environmental Management and Project Justification

17 ENVIRONMENTAL MANAGEMENT

17.1 ENVIRONMENTAL MANAGEMENT STRUCTURE

17.1.1 Environmental Management Context

Pursuant to Section 75F of the EP&A Act, the Director General may require the proponent to include "*a statement of the commitments the proponent is prepared to make for environmental management and mitigation measures on the site*".

These measures will be incorporated within site specific Construction and Operational and Vegetation Environmental Management Plans (collectively referred to as EMPs), which will provide an overall framework for the management of environmental impacts that could potentially arise from the proposed expansion of Champions Quarry. A preliminary quarry management plan (*Appendix J*) and soil and water management plan (*Appendix I*) have been prepared. The vegetation management plan will be the means by which the biodiversity offset strategy outlined in *Chapter 7* is implemented and will be developed in consultation with DECCW and DoP. All mitigation measures identified throughout the EA, and the following Statement of Commitments, will be incorporated into the EMPs.

The EMPs will accomplish the following:

- act as an environmental operations manual for quarry staff and contractors throughout construction and operation of the quarry;
- identify potential impacts of the proposed quarry and the measures proposed to mitigate these impacts as described in the preceding chapters of this EA report;
- detail how environmental safeguards are to be implemented;
- detail the timing of the implementation of the mitigation measures;
- clearly define allocations of environmental responsibilities of all staff and contractors;
- outline monitoring and reporting requirements to demonstrate compliance and licensing requirements; and
- provide procedures for reviews and updating of the EMPs.

Preparation of these EMPs will be undertaken in accordance with the requirements of the NSW Governments Environmental Management Systems Guidelines, any conditions of approvals imposed by the DoP, and licence conditions for the DECCW. The EMPs will be prepared in accordance with the relevant environmental legislation, principles of Ecologically Sustainable Development and good practice environmental procedures (including the "*Guidelines for the Preparation of Environmental Management Plans*" NSW DoP, 2004).

Successfully implementation and adherence to the EMPs will enable environmental safeguards and mitigation measures to be effectively implemented. Sustainable work practices will therefore be adopted throughout the life of the quarry. This will demonstrate the proponents intent to comply with relevant environmental legislation, prevent environmental pollution and minimise the impacts of the proposal on the environment.

17.2 STATEMENT OF COMMITMENTS

17.2.1 Introduction

The commitments listed in the following sections have been compiled based on the environmental assessments undertaken in preparation of this EA report. They provide an undertaking from the proponent indicating responsibilities and timing to implement measures to mitigate all potential adverse environmental impacts that have been identified through this assessment and ensure that the project is environmentally, socially and economically sustainable.

17.2.2 Draft Statement of Commitments

Reavill Farm Pty Ltd and Tucki Hills Pty Ltd are committed to minimizing the potential for environmental impacts from the proposed quarry expansion. *Table 17.1* outlines the measures that will be implemented to minimize any potential environmental, social and economic impacts.

Table 17.1 Statement of Commitments

Item Number	Item	Commitment	Responsibility	Timing
1	Scope of Development	The development will be carried out as outlined in the documentation and plans listed below, except where amended by other items of this Statement of Commitments, and any conditions of approval issued by the Department of Planning or Department of Environment, Climate Change and Water: • Environmental Assessment (EA) report, prepared by ERM, September 2009 and supporting reports; and • Quarry Plans (refer figures 2.5 to 2.8 of this EA report)	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
2	Roads	The primary route to and from Lismore to be via the Bruxner Highway, Coraki Road, Wyrallah Ferry Road and Wyrallah Road.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		The preferred route to and from the Pacific Highway to be Wyrallah Road or via Broadwater Road.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Prior to extraction commencing
		The intersection of Wyrallah Road and Wyrallah Ferry Road be upgraded in the form of widening for the left turn in for heavy vehicles from Wyrallah Road (refer to *Figure 18* in *Appendix F*)	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd in consultation and cooperation with Lismore City Council	Payment to Lismore City Council(as agreed in February 2009) 6 months prior to extraction commencing

Item Number	Item	Commitment	Responsibility	Timing
		Coraki Road and Wyrallah Ferry Road intersection upgraded in the form of widening for the left turn in to cater for heavy vehicles from Coraki Road (refer to *Figure 19* in *Appendix F*). The proposed design will require 90m² of pavement widening in conjunction with a two coat seal.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd in consultation and cooperation with Lismore City Council	Payment to Lismore City Council (as agreed in February 2009) 6 months prior to extraction commencing
		Payment of road contributions to Lismore City Council.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		Reduction in the speed limit on Wyrallah Road from 100km/hr to 80km/hr to the Tuckurimba intersection.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd in consultation and cooperation with Lismore City Council	Prior to extraction commencing
		Vegetation be cleared that obscures the T-junction warning sign in Wyrallah Ferry Road on the approach to the Bridge.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd in consultation and cooperation with Lismore City Council	Prior to extraction commencing
		A '200m' distance plate be added to the above sign.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title in consultation with Lismore City Council and NSW RTA.	Prior to extraction commencing
		When the quarry has an increased truck volumes forecast for particular periods, this information to be forwarded onto the local bus companies.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing

Item Number	Item	Commitment	Responsibility	Timing
3	Aboriginal Heritage	All site employees/contractors will undergo site induction training that includes stop work procedure if archaeological sites are discovered.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd	Ongoing
		Information regarding heritage requirements will be made available on-site for employees/contractors.	As Above	As Above
		If an Aboriginal item is found all work will cease and the police (in the case of human remains), relevant Aboriginal community groups and a suitably qualified archaeologist contacted	As Above	As Above
		Aboriginal Burial Management Plan to be in place prior to the commencement of works. This plan should be written in conjunction with the Local Aboriginal Land Council and other stakeholder groups.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd in consultation with the Local Aboriginal Land Council and DECCW	Prior to extraction commencing
4	Ecological Considerations	The biodiversity offset strategy shown in *Figure 6.1* will be implemented through a vegetation management plan developed in consultation with DECCW and the DoP. This will be aimed at "locking up" areas of existing vegetation outside of the *Project Area* and includes revegetation in adjoining areas. In addition, the proponent will commit to the protection and management of the offset area secured through legal enforcement of the offset strategy via a voluntary conservation agreement under the National Parks and Wildlife Act 1974 or Section 88B-E covenant of the Conveyancing Act 1919 to be negotiated by the proponent and the DoP and DECCW.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Biodiversity Offset Strategy and Vegetation Management Plan to be developed prior to extraction commencing. Implementation of Plan of Management to be ongoing

Item Number	Item	Commitment	Responsibility	Timing
		Pre-clearance inspection of each 'work cell' prior to the commencement of clearing works to identify potential fauna habitat (e.g. fallen hollow logs, and hollow-bearing trees) and identify appropriate measures. Measures to minimise impact on fauna during clearing operations will include modified clearance of hollow-bearing trees by clearing up to the tree, nudging the tree then leaving the tree to be cleared at a later period to allow any resident fauna to relocate; Where potential fauna habitat identified a suitably qualified wildlife handler would be present during clearing operations to supervise clearance and rescue any individuals where required; Pre-clearance inspection of trees to be felled for Koalas;	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Prior to commencement of any clearing works.
		Measures to minimise impact of traffic movement on fauna includes: • limiting traffic movement to daylight hours; • limiting the speed of haul trucks within the *Project Site* to 30km/h; and • selection of shrub species and/or tree species that do not provide a foraging resource for Koalas in visual screening proposed along the haul road; and • providing a break in the screening planting near the junction of the haul road and Wyrallah Road to discourage directing terrestrial fauna on to the road.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title Any truck drivers requiring access to the *Project Site*	Ongoing
		In accordance with the relevant legislation, measures will be taken to control the growth and spread of existing Camphor Laurel and Lantana infestations in the *Project Site*.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing

Item Number	Item	Commitment	Responsibility	Timing
		The existing quarry has a Rehabilitation and Final Landscape Plan. The principals of this plan will be applied to the expanded quarry operation. Work cells will be progressively rehabilitated. A large part of the proposed quarry will be rehabilitated with pasture species to grazing land as currently characterises the *Project Area*. The benches would be shaped and rehabilitated with locally occurring native species. The rehabilitation will be monitored monthly to assess establishment of vegetation and progress documented by the Environmental Officer.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
5	Noise	Provision of bunding as shown in *Figure 9.2*	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Prior to extraction commencing
		The operating hours of the quarry are restricted from 7am to 5.30pm Monday to Friday and 7.30am to 3.30pm on Saturdays..	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title All personnel associated with extraction, processing and transportation operations	Ongoing
		Road traffic noise created by the haul trucks accessing the site speed limited to 30km/h and prohibiting haul trucks from using compression braking on-site.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		Effective placement and stockpiling of product so that where possible, plant equipment can be working behind stockpiles.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing

Item Number	Item	Commitment	Responsibility	Timing
		Construction of a 4m earth bund adjacent to plant that is not shielded by permanent bunding.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		Modern, well maintained industrial equipment will be used.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		Plant operations personnel will undergo induction training into best practice quarry operations (i.e. lean manufacturing training), the benefits of which help to minimise unnecessary noise emissions from plant equipment;	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title All personnel associated with extraction, processing and transportation operations	Prior to any works commencing on site
		For compliance purposes, attended noise monitoring (at established permanent noise assessment locations) and plant equipment audits will be undertaken on an annual basis;	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		Sealing of the main access road from the site entrance intersection to the *Central Section* pit.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Prior to expansion of extraction activities commencing on site
6	Air Quality	Any unsealed internal roads on the *Project Site* will be watered at a rate of 2 L/m2/minute as required.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its	Ongoing

Item Number	Item	Commitment	Responsibility	Timing
			successors in title	
		Water sprays will be used on all mobile processing equipment and stockpiles to minimize airborne particulate matter.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		All trucks leaving the *Project Site* to have covers in place prior to leaving the weighbridge	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
		Stockpiles of overburden and topsoil being stored for utilization in rehabilitation activities to be seeded to minimize the potential for fugitive dust.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing
7	Soil and Surface Water Management	The soil and water management regime developed in accordance with the Soil and Water Management Plan provided as *Appendix I*.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	All water and soil water management devices to be put in place prior to construction commencing Management of water and soil to be ongoing.
8	Quarry Rehabilitation	The progressive rehabilitation approach developed within the Preliminary Quarry Management Plan provided as *Appendix J* to be implemented.	Reavill Farm Pty Ltd and Tucki Hills Pty Ltd, and/or its successors in title	Ongoing

18 PROJECT ALTERNATIVES AND JUSTIFICATIONS

18.1 INTRODUCTION

This chapter provides an overview of the alternatives considered in the development for the proposed expansion of Champions Quarry and throughout the EA process. The reasons for justifying the final proposal are presented, having regard to biophysical, economic and social considerations and the principles of ESD.

18.2 PROJECT ALTERNATIVES

18.2.1 No Quarry Expansion

One alternative considered was to not undertake any expansion of Champions Quarry. Whilst this option would result in no additional adverse environmental impacts, sandstone production would cease on the property after expiration of the existing approval granted by Lismore City Council (Council DA No. 2005/999). This allows for the extraction of up to approximately 64,000 tonnes per annum over a period of 15 years. Given that the total resource on the property is estimated at up to 12 million tonnes (Coffey Geotechnics, 2007), not seeking further approvals would sterilize this significant resource.

As established within *Section 2.3.2* and *Chapter 13*, access to the sandstone resource on the property is considered critical as it presents an opportunity to provide both fine and coarse sand in a highly centralised location. Given the lack of certainty over sand resources on the Far North Coast region, and the presence of large scale construction projects in the area, the option not to proceed with quarry expansion was given no further consideration.

18.2.2 Different Quarry Area

Initially, consideration was given to the establishment of an additional quarry pit to the northern side of the *Central Section* area. However, this would have significantly decreased the distance between operational elements of the quarry and sensitive receivers to the north of the *Project Area*. During assessment, it was therefore concluded that resource extraction should be confined to the southern portions of the site. This area presented the largest, and most readily accessible resource on the *Project Site*, and provided a marked separation distance between the quarry and nearby residences.

18.2.3 Alternative Quarry Methods

Extraction Methods

Due to the assessed soft nature of the material present, most extraction can be achieved with an excavator. This negates the need to undertake any drilling and blasting which are considered to be much higher impact methods. This extraction method was therefore not given any further consideration.

Quarry Plans

Detailed geotechnical investigations were undertaken at the site to evaluate the resource area and optimize the quarry plan. The following quarry plans were available to be pursued:

- extraction of the complete amount of the assessed resource, which would allow for extraction from the site to occur for a minimum of 50 years; or
- extraction not utilising a staged approach.

The quarry plans presented for approval are considered the optimal option as they allow for resource certainty for a prolonged period of time, without extending to a timeframe which potentially creates long-term regulatory uncertainty. Additionally, the staged approach allows for the rehabilitation plan put forward to be implemented, thus allowing for the site to be returned to its original land use as quickly as possible.

18.3 JUSTIFICATION

18.3.1 Introduction

The expansion of Champions Quarry presents an opportunity to access a large resource deposit that has been demonstrated to be of regional significance. This is exacerbated by the fact that many fine and coarse sand sources within the region have limited available resources, are subject to considerable environmental constraints, or are subject to compliance and regulatory intervention. The resource at Champions Quarry is readily accessible and can conceivably provide both fine and coarse sand to the Far North Coast region for over 50 years, making it of critical importance to the future of the regions economy and infrastructure. It will also provide direct and flow on employment opportunities within the Lismore Ballina region.

18.3.2 Assessment of the Suitability of the Site for the Proposed Land Use

The site presently contains an existing quarry, with approval to extract 29,000m^3 (approximately 64,000 tonnes) per annum from an approved resource of 130,000m^3. Geological investigations have been undertaken (*Appendix B*), including the drilling of a number of cored boreholes scattered across the *Project Site* to determine the extent, type and quality of the sandstone resource on the site. These investigations identified a resource to the south of the existing quarry pit to a depth of approximately 10mAHD, with the capacity to provide a range of sandstone products. Given the presence of this resource, the site is suitable for the proposed use.

As established previously, there is a substantial demand for sand and sandstone products in the Far North Coast region, including large scale Pacific Highway upgrade projects. The location of the site and size of the resource provides an economically robust source of quarried sandstone for the region.

The impact assessments demonstrate that access to the resource is subject to minimal environmental and social constraints, thus allowing for this valuable resource to be extracted from a site with negligible disturbances to the surrounding natural and built environment. The site is an established quarry, located within a predominately rural area, isolated from any built up areas, making it an ideal location for the proposed Champions Quarry expansion.

18.3.3 Public Interest

The proposed expansion of Champions Quarry is in the public interest as the potential adverse social, environmental and economic impacts are far outweighed by the social, environmental and economic benefits associated with the project. A number of key issues associated with the development have been identified, including:

- traffic and transport;
- noise;
- air quality;
- greenhouse gases;
- visual;
- local ecology;
- soil and water management;

- ecologically sustainable development;
- socio – economic impacts; and
- rehabilitation of the site to its pre existing agricultural land use.

The above issues are discussed in detail in *Part C* where it has been demonstrated that any deleterious impacts can be acceptably mitigated.

18.4 ECOLOGICALLY SUSTAINABLE DEVELOPMENT

The Brundtland Report *Our Common Future* defines ecologically sustainable development (ESD) as:

"*…..development that meets the needs of the present without compromising the ability of future generations to meet their own needs*."

The primary philosophy driving the concept of ESD is that current and future generations should leave a natural environment that functions as well or better than the one inherited. This proposal addresses meeting society's needs through the provision of a valuable resource, while maintaining a balance with the potential impacts on the physical and social environment of the Tuckurimba area. Each of the principles of ESD are individually considered below.

18.4.1 Precautionary Principle

Interpretation

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

This principle was developed in response to one of the great difficulties of interpreting scientific data – the scientific method produces results based on confidence limits. These are controlled by the scope of data acquisition, interpretation methods and general understanding within a particular scientific discipline of a particular phenomenon. This has been used as a way of validating a lack of response to a potential threat of serious or irreversible environmental degradation.

In the application of this principle:

- careful application should always be undertaken to avoid serious or irreversible environmental damage; and

- an assessment of consequences of various options should be undertaken in formulating a proposal.

ESD therefore requires that uncertainty and the associated level of risk be considered in decision making.

Justification

The environmental consequences of the proposed Champions Quarry expansion have been assessed in a detailed and thorough manner, as accurately as possible utilising specialists in relevant disciplines where required. The assessment process involved computer modelling, field validation, scientific analysis and interpretation of the individual and cumulative environmental impacts of the proposed development. This process has enabled the impacts of the proposed quarry expansion to be predicted with a reasonable degree of certainty. All predictions, however, contain a degree of uncertainty, reflecting the variable nature of the environment.

Where uncertainty has been identified within a particular scientific discipline in relation to the prediction of environmental impacts, a conservative approach was adopted to ensure that the worst case scenario was predicted in the assessment of impacts. Examples of this include:

- worst case modelling for noise impacts, including assessment of scenarios where all possible sources are operating simultaneously under unfavourable meteorological conditions;

- worst case modelling for air quality, including assessment of operational scenarios employing no dust mitigation measures with wind blowing directly towards sensitive receivers; and

- adoption of a precautionary approach when selecting threatened species potentially utilising habitat on the site for the purposes of undertaking 7-Part Tests of Significance.

The overall proposal is consistent with the precautionary principle to the extent that all potential threats to the environment have been identified and appropriate mitigation measures developed to minimize such impacts. All management procedures form part of the statement of commitments, as outlined within *Chapter 17*. These will be implemented throughout the life of the quarry.

Given the approach taken to environmental investigations undertaken during the preparation of this EA, potential impacts have been identified with adequate scientific certainty to justify proceeding with the proposed quarry expansion. The proposal therefore meets the objectives of precautionary elements of ESD principles.

18.4.2 Social Equity Including Intergenerational Equity

Interpretation

Social equity involves value concepts of justice and fairness such that the basic needs of all sectors of society are met, with a fair distribution of costs and benefits to improve the well-being and welfare of the community, population, or society as a whole. Social equity does not imply equality, but that there should be equal access to opportunities for improved welfare, with a bias towards advantaging the least well-off sectors of society.

Social equity includes intergenerational equity, which requires that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

Justification

The proposal is consistent with the principles of social equity and intergenerational equity through the efficient use of a resource that provides a number of fair and wide ranging benefits to society.

The proposed expansion of Champions Quarry will allow access to 6.25 million tonnes of an identified sandstone resource of over 12 million tonnes. The approved limits of the resource have the potential for an operation life span of up to 25 years, with considerable expansion of this being subject to future approvals. The proposed 25 year operation detailed in this assessment will ensure that the resource if extracted efficiently and in a sustainable manner such that the existing benefits afforded to the community (through access to a certain, centralised and quality resource) are maintained or enhanced providing both intra and intergenerational equity. The quarry plan developed will ensure that access to the remainder of the resource can be readily achieved, further adding to the benefit of future generations.

Social and economic benefits to the local community are expected through the production of local employment opportunities, the transfer of technical and commercial skills to local industry, the development of local capacity, and positive multiplier effects in the broader region. The end use of products from the quarry, particularly in regards to the provision of resource to Pacific Highway upgrade projects, is also considered to be of substantial social and economic benefit to not only the local community, but to the wider public who utilise the Pacific Highway.

The quarry plan developed will ensure that at any one time there is only 9ha of operation quarry. This allows for the staged rehabilitation of the site back to its original agricultural carrying capacity, thus not denying the original use of the site to future generations. The preliminary rehabilitation plan has been outlined within *Section 2.7*.

18.4.3 Conservation of Biological Diversity and Maintenance of Ecological Integrity

Interpretation

Biological diversity refers to the diversity of genes, species, populations, communities and ecosystems, and the linkages between them. Biological resources provide food, medicines, fibres and industrial products, as well as having intrinsic in situ value. They are also responsible for vital ecological services such as maintaining soil fertility and the supply of clean and fresh water. Maintaining biological diversity safeguards life support functions and can be considered a minimal requirement for intergenerational equity.

Justification

A comprehensive assessment of the likely impacts of the proposal on flora and fauna is detailed in *Chapter 7* and *Appendix C*.

The detailed ecological assessment (*Appendix C*) concluded that, with the implementation of basic mitigation measures, the proposed expansion of Champions Quarry will not significantly impact on any threatened species or their habitats or any endangered ecological communities. Whilst the vast majority of vegetation to be disturbed is introduced pastures, the mitigation measures developed for the site will result in the long-term improvement in the vegetation and habitat quality of the site. This results from the retention of the majority of significant vegetation on the site, as well as the planting of new areas of vegetation to aid in visual impact mitigation and Koala movement corridors. This will improve habitat connectivity within the site.

18.4.4 Improved Valuation and Pricing of Environmental Resources

Interpretation

This principal is a component of intergenerational equity. It relates to the need to determine proper values for services provided by the natural environment, such as the environments ability to receive gaseous emissions, cultural values and visual amenity.

Applying standard methods of valuation and pricing to environmental resources is a difficult process. This is largely due to the intangible nature of much of the natural environment. The environment has historically and conveniently, been considered a free resource, with the true cost to the environment not factored into cost of production or use of that resource.

This principle involves placing a monetary or social value on the environment that ultimately increases its value so as to decrease future exploitation. Pollution and future exploitation can be controlled under the polluter pays principle, whereby polluters who degrade the natural environment are responsible and accountable for returning it to its previous condition.

Justification

This EA examines all environmental, social and economic consequences of the proposed expansion of Champions Quarry and has identified a number of mitigation measures for any potential adverse impacts associated with the proposal. These have been included within the statement of commitments. The mitigation measures have been developed concurrently with the environmental assessment and have been incorporated directly into the quarry design. The proposal has therefore been subject to continuous refinement and involves a higher level capital expenditure (i.e. extensive vegetation planting, bunding, and water management structures) to ensure a sustainable outcome. The cost of these measures can be used as an indirect indication of the value of environmental resources.

18.5 CONCLUSION

This EA has assessed the potential environmental impacts associated with the proposed expansion of Champions Quarry. Initial geological investigation revealed a total resource of up to 12 million tonnes contained on land owned by the proponent. The proposal would allow for access to 6.25 million tonnes of this resource, at the rate of 250,000 tonnes per year, thus allowing quarry to take place for up to 25 years, disturbing an area of approximately 16 hectares. Excavation is proposed to initially commence in the existing established *Central Section* pit, prior to moving to the south in a newly established southern pit.

The EA was prepared having regard to biophysical, economic and social considerations and the principles of ESD. No significant environmental impacts have been identified during the preparation of the EA that cannot be mitigated with the implementation of appropriate mitigation measures and management strategies.

The environmental assessment process has been utilized to drive the development of quarry design and ensure that operations will be sustainable and create minimal impacts to the surrounding area. Quarry operations have been designed to be self sufficient in terms of water usage, minimise traffic impacts on the local road network, minimize the visual intrusiveness of all on site elements of the quarry, as well as the elimination of any adverse noise and air quality impacts on adjoining properties. All mitigation measures and management practices identified in the EA from part of the statement of commitments for the proposal and will be incorporated into the environmental management plans for construction and quarry operations.

The proposed quarry expansion has the opportunity to provide long-term security over a sandstone resource which has been demonstrated to be vital to the supply of construction materials in the Far North Coast of New South Wales. The expansion is capable of being undertaken with minimal environmental impacts and is thus justifiable when considered in conjunction with the substantial economic benefits it will provide.

The wide range of sand products able to be produced from Champions Quarry will be able to be used to meet fundamental community needs for the construction of buildings and roads in the rapidly growing Far North Coast region. The lack of a similarly sized resource of sufficient quality to provide the range of products that Champions Quarry is capable of presently necessitates the importation of product from outside of the region. The extraction and use of this material will have positive flow on effects throughout the local economy through the creation of jobs, both directly by the quarry and through associated industries.

All the potential environmental impacts of the proposed development have been considered and mitigation measures developed to minimize any impacts as detailed throughout this EA report. Control and regulation of these impacts will be the responsibility of the operators of Champions Quarry and the Department of Environment, Climate Change and Water through the Environment Protection Licensing process. It is therefore concluded that the establishment of an expanded Champions Quarry is justified in terms of all environmental, social and economic considerations and, furthermore, is able to be operated and monitored throughout its life such that the predicted outcomes are fulfilled.

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