Section 7
Evaluation and Justification of the Project

This section concludes the assessment of the proposed Calga Sand Quarry Southern Extension. The key assessment requirements (of the Director-General's requirements) and other issues identified as having higher unmitigated risk rankings (see Section 3.3.1) are reassessed based on the implementation of the proposed safeguards, controls and mitigation measures and a residual risk level determined. The Project is then evaluated based on the residual risk posed and in consideration of ecologically sustainable development (ESD) principles.

A justification for the Project is then provided based on the residual impacts of the Project, the likely economic and social benefits that would be generated and the consequences locally, regionally and nationally of the Project not going ahead.

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7.1 INTRODUCTION

As a conclusion to the *Environmental Assessment*, the proposed Calga Sand Quarry Southern Extension is evaluated and justified through consideration of both the potential impacts on the environment and benefits to the local and wider community.

Project evaluation has been undertaken by firstly reassessing the risks posed to the local environment by Project activities, following consideration of the controls, safeguards and/or mitigation measures proposed by Rocla and summarised in Section 5. The Project has also been evaluated against the principles of Ecologically Sustainable Development (ESD) in order to provide further guidance as to the acceptability of the Project, as presented in the *Environmental Assessment*.

Section 7.3, which presents the justification of the Project, revisits the predicted residual impacts on the biophysical environment, considers the socio-economic benefits which would be provided and assesses the consequences of not proceeding with the Project.

7.2 EVALUATION OF THE PROJECT

7.2.1 Residual Environmental Risk and Impacts

Following consideration of the proposed operational safeguards, controls and mitigation that would be implemented by Rocla as part of the Project design, **Table 7.1** re-assesses the **mitigated** environmental risk associated with each of the potential environmental impacts identified in Section 3.3. It is noted that in some cases no residual risk rating has been allocated as the assessment recorded in Section 4B has determined that the impact would not occur.

Table 7.1
Analysis of Mitigated Environmental Risk

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Potential Environmental Impacts (see Table 3.5)	Level / Scale of Impact (if applicable)	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Groundwater					
Groundwater Pollution by leaking / spilt pollutant	Contamination requiring minor recovery works	**M**	**2**	**E**	**L**
	Contamination requiring major recovery works	**H**	**2**	**E**	**L**
Drawdown of groundwater levels	Reduced water levels within the aquifer of the Lower Mangrove and Popran Creeks Groundwater Source of the Kulnura Mangrove Mountain Water Sharing Plan (WSP) on the Project Site.	**H**	**1**	**D**	**L**
	Reduced water levels within the aquifer of the Lower Mangrove and Popran Creeks Groundwater Source of the Kulnura Mangrove Mountain WSP on adjoining properties to the Project Site.	**H**	**2**	**D**	**L**

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Environmental Impacts (see Table 3.5)	Level / Scale of Impact (if applicable)	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Groundwater (Cont'd)					
Drawdown of groundwater levels	Reduced water levels within the entire aquifer of the Lower Mangrove and Popran Creeks Groundwater Source of the Kulnura Mangrove Mountain WSP.	**H**	**3**	**E**	**M***
Reduction in groundwater bore yields	Reduced yields observed in groundwater bores on Proponent owned land.	**M**	**1**	**C**	**L**
	Reduced yields of up to 15% occur within groundwater bores on privately owned (non-project related) land.	**M**	**1**	**C**	**L**
	Reduced yields of >15% occur within groundwater bores on privately owned (non-project related) land.	**H**	**2**	**C**	**M**
Impacts on Groundwater Dependent Ecosystems (GDE's)	Reduced groundwater availability to GDEs on the Project Site.	**H**	**2**	**C**	**M**
	Destruction or degradation of Project Site GDE(s) as a consequence of the project.	**H**	**1**	**B**	**M**
	Reduced groundwater availability to GDEs downstream of the Project Site.	**H**	**2**	**D**	**L**
	Destruction or degradation of downstream GDE(s) as a consequence of the project.	**H**	**3**	**E**	**M***
Air Quality					
Nuisance - deposited dust	Deposited dust levels attributable to the project occasionally (for one or two months every year) above DECC guideline, affects only adjacent landholders.	**M**	**2**	**E**	**L**
	Deposited dust levels attributable to the project regularly (exceedances greater than DECC guideline for >5 months per year) affects landholders some distance from the Project Site.	**H**	**3**	**E**	**M***
	Deposited dust levels attributable to the project resulting in impacts to adjoining vegetation.	**M**	**2**	**E**	**L**
Health - PM_{10}	PM_{10} levels attributable to the project occasionally (once every 1 to 2 years) above the project goal, affects only adjacent landholders.	**M**	**2**	**E**	**L**
	PM_{10} levels attributable to the project occasionally (>5 times per year) above the project goal, affects landholders some distance from Project Site.	**H**	**3**	**E**	**M***
Health – Crystalline Silica	Concentration of respirable crystalline silica resulting in respirable disease in residents surrounding the Project Site.	**H**	**4**	**-**	

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Environmental Impacts (see Table 3.5)	Level / Scale of Impact (if applicable)	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Soil Erosion and Sedimentation					
Greenhouse Gas Emissions	Small increase (<0.05%) in greenhouse gas emissions (compared to 1990 Australia emissions).	**M**	**1**	**B**	**M***
	Moderate increase (>0.05%, <0.1%) in greenhouse gas emissions (compared to 1990 Australia emissions).	**M**	**2**	**E**	**L**
	Significant increase (>0.1%) in greenhouse gas emissions (compared to 1990 Australia emissions).	**M**	**3**	**E**	**M***
Soil erosion	Erosion of disturbed areas on the Project Site.	**M**	**2**	**D**	**L**
	Erosion of rehabilitated areas and/or final landform of the Project Site.	**H**	**2**	**D**	**L**
Sediment Load and Turbidity	One-off discharge of dirty water from the Project Site.	**M**	**2**	**D**	**L**
	Regular discharge of dirty water from the Project Site.	**H**	**3**	**E**	**M***
Surface Water/Flooding and Drainage					
Reduced natural surface water flows	Reduced environmental flows to Cabbage Tree Creek catchment.	**H**	**1**	**E**	**L**
	Reduced groundwater availability to GDEs downstream of the Project Site.	**H**	**2**	**D**	**L**
	Reduced available recharge to groundwater.	**M**	**2**	**D**	**L**
Reduced quality of downstream waters	Isolated and minor event resulting in temporary degradation of water quality in local creeks and tributaries, eg. minor discharge of 'dirty' water.	**H**	**2**	**D**	**L**
	Continuing discharge of contaminated water resulting in ongoing degradation of water quality in local creeks and tributaries, eg. frequent or periodic discharge of dirty water.	**H**	**3**	**E**	**M***
	Isolated and major event resulting in temporary but wider spread degradation of water quality, eg. discharge of hydrocarbons to the downstream catchment.	**H**	**4**	**E**	**H***
	Repeated major event resulting in long-term and wide spread degradation of water quality, eg. repeated or continued discharge of hydrocarbons to the downstream catchment.	**H**	**4**	**-**	
Flora and Fauna					
Loss of, or alteration to, existing habitats.	Disturbance to native vegetation / habitat within nominated area of disturbance.	**H**	**1**	**B**	**M#**
	Disturbance to native vegetation / habitat outside nominated area of disturbance.	**M**	**2**	**D**	**L**

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Environmental Impacts (see Table 3.5)	Level / Scale of Impact (if applicable)	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Noise and Vibration					
Direct adverse impact on threatened species.	Disturbance to Endangered Ecological Community (ies).	**H**	**3**	**-**	
	Disturbance to threatened species or populations.	**H**	**1**	**B**	**M**
Reduced biodiversity	Reduction in local biodiversity	**H**	**3**	**-**	
	Reduction in regional biodiversity	**H**	**4**	**-**	
Increased noise levels associated with Project Site activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A))	**L**	**2**	**E**	**L**
	Regular minor exceedance of noise criteria (1-2dB(A))	**M**	**2**	**E**	**L**
	Occasional marginal exceedance of noise criteria (3-5dB(A))	**M**	**2**	**E**	**L**
	Regular marginal exceedance of noise criteria (3-5dB(A))	**H**	**3**	**E**	**M***
	Occasional major exceedance of noise criteria (>5dB(A))	**M**	**3**	**E**	**M***
	Regular major exceedance of noise criteria (>5dB(A))	**H**	**3**	**E**	**M***
Increased noise / vibration levels associated with project traffic activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A))	**L**	**2**	**E**	**L**
	Regular minor exceedance of noise criteria (1-2dB(A))	**L**	**2**	**E**	**L**
	Occasional marginal exceedance of noise criteria (3-5dB(A))	**M**	**2**	**E**	**L**
	Regular marginal exceedance of noise criteria (3-5dB(A))	**H**	**3**	**E**	**M***
	Occasional major exceedance of noise criteria (>5dB(A))	**M**	**3**	**E**	**M***
	Regular major exceedance of noise criteria (>5dB(A))	**H**	**3**	**E**	**M***
Maximum noise levels resulting in sleep disturbance		**M**	**3**	**-**	
Increased noise levels associated with the project leading to impacts on the native fauna assemblage.		**M**	**2**	**E**	**L**
Traffic and Transport					
Increased traffic congestion		**M**	**1**	**C**	**L**
Road pavement deterioration		**M**	**1**	**C**	**L**
Elevated risk of accident/incident on local roads	Minor accident – no injury	**L**	**2**	**D**	**L**
	Minor accident – minor injury	**H**	**3**	**E**	**M***
	Major accident –moderate injuries requiring hospitalisation	**H**	**4**	**E**	**H***
	Severe accident – severe injuries or death injury	**E**	**5**	**E**	**H***

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Environmental Impacts (see Table 3.5)	Level / Scale of Impact (if applicable)	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Rehabilitation, Final Landform & Biodiversity Offsets					
Reduced amenity of the final landform resultant from vegetation clearing.		**M**	**2**	**D**	**L**
Final landform and land use that is not compatible with activities / lifestyle of local community or Popran National Park.		**H**	**3**	**E**	**M***
Aboriginal Heritage					
Impact on identified Aboriginal sites and/or artefacts of high cultural or scientific significance as a result of the project.		**H**	**3**	**E**	**M***
Impact on identified Aboriginal sites and/or artefacts of lower cultural or scientific significance as a result of the project.		**M**	**2**	**E**	**L**
Impact on unidentified Aboriginal sites and/or artefacts as a result of the project.		**M-H**	**2-3**	**E**	**L-M***
Visual Amenity					
Reduced amenity of altered Project Site landform	Temporary disturbance to landform.	**H**	**1**	**A**	**H#**
	Marginally identifiable change to landscape following rehabilitation and final landform creation.	**H**	**2**	**C**	**M**
	Highly identifiable change to landscape following rehabilitation and final landform creation.	**M**	**2**	**D**	**L**
Land Contamination / Waste Management					
Hydrocarbon Contamination of land	Contamination requiring minor recovery works.	**L**	**2**	**E**	**L**
	Contamination requiring major recovery works.	**H**	**3**	**E**	**M***
Hydrocarbon Contamination of water	Contamination of surface water requiring minor recovery works.	**M**	**2**	**D**	**L**
	Contamination of surface water requiring major recovery works.	**H**	**3**	**E**	**M***
	Contamination of groundwater requiring recovery works.	**M**	**3**	**E**	**M***
Reduced amenity of Project Site due to poor rubbish, litter management		**M**	**2**	**D**	**L**
Soil Resources					
Insufficient soil quantities for rehabilitation		**M**	**1**	**D**	**L**
Reduced soil quality	Temporary disturbance to soil	**M**	**1**	**B**	**M***
	Degradation of soil quality	**M**	**2**	**D**	**L**
Elevated erosion or erosion potential.		**H**	**2**	**E**	**L**

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Table 7.1 (Cont'd)
Analysis of Mitigated Environmental Risk

Potential Environmental Impacts (see Table 3.5)	Level / Scale of Impact (if applicable)	Unmitigated Risk Rating	Consequence of Occurrence if Mitigated	Likelihood of Occurrence if Mitigated	Residual Risk Rating
Bushfire					
Initiation of fire leading to impacts on the Project Site	Minor disturbance to Project Site lands and equipment resulting in temporary suspension of operations.	**M**	**2**	**D**	**L**
	Major damage to Project Site lands and equipment resulting in long-term or complete suspension of operations.	**H**	**4**	**E**	**H***
	Impacts on health and safety of project personnel.	**H**	**4**	**E**	**H***
Initiation of fire leading to impacts outside the Project Site	Minor disturbance to lands and property external to the Project Site.	**M**	**2**	**D**	**L**
	Major disturbance to lands and property external to the Project Site.	**H**	**4**	**E**	**H***
	Impacts on health and safety of local land owners, residents and the general public.	**E**	**4**	**E**	**H***
Socio-Economic Impacts					
Reduced quality of life (actual or perceived)		**M**	**3**	**E**	**M***
Reduced property values	Temporary decrease in property values	**M**	**2**	**D**	**L**
	Moderate term decrease in property values	**H**	**2**	**D**	**L**
	Long term decrease in property values	**H**	**3**	**E**	**M***

Consequence of Occurrence: 1 = Insignificant; 2 = Minor; 3 = Moderate; 4 = Major; 5 = Catastrophic
Likelihood of Occurrence: A = Almost Certain; B = Likely; C = Possible; D = Unlikely; E = Rare
Risk Rating: E = Extreme; H = High; M = Moderate; L = Low

Note * This is the lowest possible risk rating given the likelihood of occurrence category of E: Rare
Note # This is the lowest possible risk rating given the consequence of occurrence category of 1: Insignificant

Through the implementation of the proposed controls, safeguards and mitigation measures summarised in Section 5, the risk rating for the majority of potential environmental impacts has been reduced to either a moderate or low risk rating.

In some cases, a rating is no longer provided as the relevant assessment recorded in Section 5 determined the likelihood to be so low, or consequence so insignificant, as to be virtually non-existent. This approach was generally taken when the risk rating could not be considered any lower than "high" (due to a likelihood classification as "almost certain" or consequence classification as "catastrophic") so as not to suggest a significance that does not exist.

Further consideration is given to the potential impacts which retain a "high" risk rating as follows.

- Isolated and major event on the Project Site resulting in the widespread degradation of downstream water quality, eg. discharge of hydrocarbons to the downstream catchment.

  While all appropriate controls would be implemented, eg. correct storage and bunding of hydrocarbons, appropriate design and maintenance of water management structures, regular inspections of all erosion and sediment controls, the potential still remains that a freak storm, or on-site incident resultant from human error may lead to a discharge of dirty or contaminated water.

The potential consequence of this occurrence would be major and therefore, despite the occurrence being identified as rare (and more likely not at all), the associated risk is high. As noted in the table, given the consequence category of "major", the "high" is the lowest attributable risk rating. Notably, the proposed safeguards included in Section 5 are assessed to be stringent enough to ensure that this type of major event would not be ongoing, nor would it occur on regular or multiple occasions.

- Major or severe accident resultant from road transport from the Project Site.

  While every precaution has been and would be taken by the Proponent in relation to the design of traffic management and education of its workforce, the potential consequence of a major or severe accident is such that a high risk rating applies.

- Temporary disturbance to the existing landform and marginally identifiable change to the landscape.

  While the potential consequence of the impact is considered insignificant, because it is considered almost certain to occur, the high risk rating applies.

- Impacts associated with bushfire either initiated on the Project Site or on lands external to the Project Site.

  While a bushfire is considered to have a potentially rare occurrence, the consequence could be major and as such a high risk rating applies despite the incorporation of project safeguards which would minimise the potential for fire on the Project Site.

The risks associated with the majority of possible environmental impacts are considered moderate or less and therefore, while these may result in impacts deemed unacceptable to some stakeholders, the development and operation of the Project, with the implementation of appropriate management plans, are overall considered acceptable.

7.2.2 Ecologically Sustainable Development

7.2.2.1 Introduction

Sustainable practices by industry, all levels of government and the community are recognised to be important for the future prosperity and well-being of the world. The principles of Ecologically Sustainable Development (ESD) that have been recognised for over almost two decades were based upon meeting the needs of the current generation while conserving our ecosystems for the benefit of future generations. In order to achieve sustainable development, recognition needs to be placed upon the integration of both short-term and long-term environmental, economic, social and equitable objectives.

Throughout the design of the Project, the Proponent has endeavoured to address each of the sustainable development principles. The following sub-sections draw together the features of the Project that reflect the four principles of sustainable development, namely:

- the precautionary principle;
- the principle of social equity;

- the principle of the conservation of biodiversity and ecological integrity; and
- the principle for the improved valuation and pricing of environmental resources.

7.2.2.2 The Precautionary Principle

In order to satisfy the principle of ESD, emphasis must be placed on anticipation and prevention of environmental damage, rather than reacting to it. During the planning phase for the Project and throughout the preparation of the *Environmental Assessment*, Rocla has engaged specialist consultants to examine the existing environment, predict possible impacts and recommend controls, safeguards and/or mitigation measures in order to ensure that the level of impact satisfies statutory requirements or reasonable community expectations. Throughout the development of the Project, Rocla and its consultants have adopted an anticipatory approach to impacts, particularly to the ecological values of the Project Site and its surrounds by undertaking an analysis of the risks posed by activities of the Project, an appropriate level of research and baseline investigations, environmental evaluation and development of an appropriate biodiversity offset strategy. The controls, safeguards and/or mitigation measures have therefore been planned with a comprehensive knowledge of the existing environment and the potential risk of environmental degradation posed by Project activities.

The implementation of the environmental safeguards, controls and mitigation measures has been formalised by Rocla as the draft Statement of Commitments presented as Section 6.

Examples of matters relating to the precautionary principle that were considered during the various stages of the Project are listed below.

Objectives of the Project

The Project has been designed with the principal objective being to develop and operate the proposed quarry extension in a safe and environmentally responsible manner, and which meets the requirements of local and State government agencies, accepted industry standards and wherever possible, reasonable community expectations. Rocla recognises that only through comprehensive environmental assessment and an environmentally responsible approach to the design and operation of the Project can the risk of harm to the environment be minimised. Demonstration of this approach is provided both by the identification and prioritisation of issues (Section 3) for which a risk analysis formed an important component, and the draft Statement of Commitments provided in Section 6.

Design of Project Components

Several design aspects of the Project were modified during the planning stage in order to ensure the requirements of local and State government agencies, accepted industry standards and wherever possible, reasonable community expectations were met. These included the following.

- The proposed extraction area was reduced in size several times to reduce the level of potential environmental impact associated with the Project. These reductions included:
  - Separation of the extraction area into Stages 4 and 5, to avoid disturbance to Creek B.

  - Excision of a rectangular section of Stage 4 to avoid and provide a buffer to two Aboriginal heritage areas.
  - Excision of a section of Creek A from the Stage 4 extraction area to avoid an Aboriginal heritage site and habitat of the threatened Red-crowned Toadlet.
  - Excision of an area along the northern boundary of Stage 5 to avoid potential habitat of the threatened Giant Burrowing Frog.
  - Excision of a small area at the northeastern corner of Stage 4 to avoid a small population of the threatened *Callistemon linearfolius*.

- Management and placement of all overburden and silt generated by the washing process within the footprint of Stage 4 and overburden within the footprint of Stage 5.
- Use of overburden to create acoustic bunds around the active extraction stages within Stages 4 and 5.
- The inclusion of a biodiversity offset strategy to compensate for the disturbance to native vegetation and fauna habitat within the Project Site.
- The rehabilitation of the Stage 5 extraction area to provide for long-term nature conservation which would ultimately be incorporated into the biodiversity offset strategy.

Integration of Safeguards and Procedures

The framework for ongoing environmental management, operational performance and rehabilitation of the Project Site would be provided through the project approval. An annual report would be prepared which would report on the progress of the operation and provide an opportunity to review the effectiveness of the environmental management strategies adopted. In addition:

- all on-site procedures would be regularly reviewed, particularly in light of monitoring results;
- surface water, groundwater, noise, deposited dust and particulate matter levels would be monitored at locations potentially most affected by the Project in order to ensure the continued compliance of the operation with goals outlined in this document;
- the principles outlined in the surface water management plan (of Section 5.2.5) would be adopted to minimise any impact on water quality or quantity exiting the Project Site. Wherever possible, areas not required for extraction or associated activities would remain vegetated to assist in minimising erosion and reducing the suspended sediment load in surface water flowing through the Project Site; and
- topsoil and subsoil would be stripped, stockpiled and re-spread on the basis of the quality of the soil, and planned final land use of different areas of the final landform.

Rehabilitation and Subsequent Land Use

Long term adverse impacts on the local environment would be avoided through the design and rehabilitation of the Stage 5 extraction area to native vegetation, which would be incorporated into a larger biodiversity offset strategy. The continued use of the Project Site for commercial activities would also be provided for with the Stage 3 and 4 extraction areas rehabilitated in such a way as to be suitable for future land uses such as a product transfer terminal, intensive agriculture, horticulture or other uses.

Conclusion

The precautionary principle has been considered and adopted during all stages of the design and assessment of the Project. The approach adopted, ie. initial assessment, consultation, specialist investigations and safeguard design, provides a high degree of certainty that the Project would not result in any major unforeseen impacts.

7.2.2.3 Social Equity

Social equity embraces value concepts of justice and fairness so that the basic needs of all sectors of society are met and there is a fair distribution of costs and benefits to the community. Social equity includes for both inter-generational (between generations) and intra-generational (within generations) equity considerations.

Equity within generations requires that the economic and social benefits of the development be distributed appropriately among all members of the community. Equity between generations requires that the non-material well-being or "quality of life" of existing and future residents of the local community would be maintained throughout and beyond the life of the Project.

Both elements of social equity are addressed through the design of the Project itself, the implementation of operational safeguards to mitigate any short-term or long-term environmental impacts, and the proposed rehabilitation of the areas directly disturbed. Examples of matters relating to social equity that are relevant to the various stages of the proposed development are listed below.

Identification of Project Objectives

The major objective of the Project is the recovery of the sand resource from the Project Site to ensure the continued provision of a construction materials forecast to be in short supply in the immediate future to the Sydney and Central Coast construction markets, at a reasonable price and in an efficient, environmentally responsible manner.

The Project would also be developed with the objective of maximising the economic benefits to the local community and Gosford LGA through provision of employment, and a purchasing policy specifying the local purchase of project-related consumables such as fuel, oil, cleaning products etc. This objective would require a commitment to employee training for which Rocla places considerable emphasis upon.

The Project has also been designed with the objective to ensure the continued viability of surrounding land uses throughout and beyond the life of the Project.

Site Selection

The selection of the site for the Project reflects a concern for social equity in that it provides for the production of sought after building and construction raw materials whilst impacting on as few people as possible. This is particularly evident when compared to the other possible locations for sand extraction on the Somersby Plateau, which are located in closer proximity to residential zones (or other sensitive developments such as schools). The Project Site is effectively bound to the west and southwest by undeveloped land, with nearby residential development further limited by the proximity of the F3 Freeway to the south (which also limits the travel distance and number of residences passed by product carrying trucks on Peats Ridge Road).

Design of Project Components

The Project has been designed to maintain inter-generational equity, ie. in recognition that the removal of the sand resource is a short term land use, and to ensure components of the existing biological, social and economic environment available to existing generations would also be available to future generations.

- The proposed extraction areas have been designed to ensure that disturbance to local populations of Threatened flora, fauna habitat and Aboriginal heritage sites would be minimised.
- A biodiversity offset strategy would be established to compensate for any disturbance to native vegetation and fauna habitat and to safeguard the populations of Threatened flora and fauna species and provide a higher level of protection and management to these threatened species.
- The availability of groundwater to surrounding landholders, although not predicted to be significantly affected by the Project, would be monitored throughout the life of the Project and compensatory measures taken in the event reductions in the availability (yield) are identified.
- The rehabilitation of the Project Site has been designed to provide a visually acceptable landform available for future use by the local community.

Integration of Safeguards and Procedures

Rocla recognises that all members of the local community should benefit appropriately from the Project either directly or indirectly. In order to ensure a realistic distribution of benefits, Rocla would continue to consult with the local community and maintain a pro-active approach to issues of interest. This dialogue would also include a system to record, manage and respond to any complaints relating to the operation.

Rehabilitation and Subsequent Land Use

The proposed final landform would provide for future use of the Project Site, either in an economic capacity or for recreational use as nature conservation areas in keeping with the NSW Government's draft Central Coast Regional Strategy.

Conclusion

The principle of social equity has been addressed throughout the site selection and design of the Project. The proposed Southern Extension of the Calga Sand Quarry would contribute significantly to the economic activity of the local and regional community through the generation of employment, and increased demand for local goods and services and flow-on effects. As such, the benefits of the Project would be distributed throughout the local community. The Project was also designed such that elements of the existing environment available to this generation, including water and local biodiversity would continue to be available to future generations. Rocla would adopt a pro-active approach in identifying and addressing any concerns identified by the local community.

7.2.2.4 Conservation of Biological Diversity and Ecological Integrity

The protection of biodiversity and maintenance of ecological processes and systems are central goals of sustainability. It is important that developments do not threaten the integrity of the ecological system as a whole or the conservation of threatened species in the short- or long-term. Details of how the Project has been designed to achieve compliance with these principles are set out below.

Identification of Project Objectives

The Proponent is committed to undertake all activities in an environmentally responsible manner, and recognises the need to ensure that changes to natural components of the environment do not significantly adversely affect biological diversity or ecological integrity. As such, the Project has been designed to:

- avoid, as far as practicable, impacts on threatened flora and fauna through the design of the two extraction areas;
- minimise the potential impacts on threatened flora and fauna (and native vegetation and fauna habitats generally) through the development and implementation of the biodiversity offset strategy;
- mitigate impact on local ecology through the rehabilitation of the Stage 5 extraction area to native vegetation and implementation of a plan to manage the vegetation over the Project Site; and
- maintain surface and base flows to Cabbage Tree Creek and the downstream groundwater dependent ecosystems.

Design of Project Components

Rocla, on advice from the specialist consultancies commissioned to assist with the design and to assess most of the impact of the Project, has provided for the conservation of biological diversity and ecological integrity through the following design elements.

- Water management structures have been designed and would be constructed to ensure that only water within DECCW specified criteria leaves the Project Site and enters the Cabbage Tree Creek catchment.

- All overburden, silt and soil would be managed within the extraction area footprints, thus requiring no additional disturbance on the Project Site.
- The extraction areas have been designed to avoid several populations of threatened flora species and habitat of threatened fauna. In addition, disturbance to Creek B has been avoided to maintain surface flows to Cabbage Tree Creek and downstream groundwater dependent ecosystems.
- The construction of internal roads and access routes would minimise disturbance to native vegetation.
- The disturbance to native vegetation and fauna habitats would be compensated by the establishment of a biodiversity offset strategy which would conserve 2ha of native vegetation for every 1ha disturbed.
- Progressive rehabilitation of the Project Site would include the enhancement of local habitat corridors.

Integration of Safeguards and Procedures

The Proponent would implement the following Safeguards and Procedures to maximise the conservation of biological diversity and ecological integrity on and surrounding the Project Site.

- Pre-clearing surveys of native vegetation would be undertaken and any threatened species encountered would be relocated prior to clearing.
- Cleared vegetation would be retained and used in the rehabilitation of areas designated for native vegetation re-establishment.
- Post-extraction rehabilitation of the Project Site would include the establishment of native vegetation which would be incorporated into the biodiversity offset strategy.
- Weed eradication programs would be developed and implemented, as required.

Rehabilitation and Subsequent Land Use

The final landform has been designed to provide for some ongoing commercial activity, however, a significant proportion of the Project Site and final landform would be rehabilitated to native vegetation and entered into long-term conservation through the biodiversity offset strategy.

Conclusion

The Project addresses the principle of conservation of biological diversity and ecological integrity through the minimisation of disturbance to areas of native vegetation, and conservation of greater areas of native vegetation than are disturbed. Should threatened species be identified within those areas of the Project Site to be disturbed, these would be relocated or managed appropriately in consultation with DECC or a suitably qualified professional. Weed eradication programs would be implemented as appropriate and would further assist in addressing the principle of sustainable development.

7.2.2.5 Improved Valuation and Pricing of Environmental Resources

The issues that form the basis of this principle relate to the acceptance that the polluter pays, all resources are appropriately valued, cost-effective environmental stewardship is adopted and the adoption of user-pays principle based upon the full life cycle of the costs. A reflection of these issues on the Project is set out below.

Identification of Project Objectives

The Proponent's principal objective is to operate the Project in a profitable, safe and environmentally responsible manner, which demonstrates that an appropriate value has been placed on elements of the existing environment.

Design of Project Components and Integration of Safeguards and Procedures

The extent of research, planning and design of environmental safeguards, mitigation measures and offset strategies to prevent irreversible damage to environmental resources, other than the sand to be extracted, is evidence of the value placed by Rocla on these resources.

Rehabilitation and Subsequent Land Use

The design of the final landform to integrate ongoing commercial activities with the re-establishment and conservation of native vegetation illustrates the value placed by Rocla on both the commercial and ecological elements of the Project Site.

Conclusion

The value placed by Rocla on environmental resources is evident in the identification of Project objectives, extent of site-specific research, planning and environmental safeguards and measures to be implemented to prevent irreversible damage to the environment on and surrounding the Project Site. It is planned that the income received from the sale of the quarry products would be sufficient to enable Rocla to achieve an acceptable profit level whilst undertaking all environmentally-related tasks and meeting all commitments in all approvals, licences and permits and those made to the local community.

7.2.2.6 Conclusion

The approach taken in planning the Project has been multi-disciplinary, involved consultation with potentially affected local residents and various government agencies and emphasis on the application of safeguards to minimise potential environmental, social and economic impacts. The design of the Project has addressed each of the sustainable development principles, and on balance, it is concluded that the proposed Southern Extension of the Calga Sand Quarry achieves a sustainable outcome for the local and wider environment.

7.3 JUSTIFICATION OF THE PROJECT

7.3.1 Introduction

In assessing whether the development and operation of the Project is justified, consideration has been given both to the predicted residual impacts on the local and wider environment and the potential benefits the Project would have for the Proponent, the Gosford LGA, NSW and Australia. When considering the predicted residual impacts, a review of the proposed controls, safeguards and mitigation measures prepared by Rocla was also undertaken to determine the emphasis placed on impact minimisation and the incorporation of the principles of ESD.

This section also considers the consequences of the Project not proceeding.

7.3.2 Biophysical Considerations

The Project would have a range of impacts on the biophysical environment. Section 5 of this document identified the potential residual biophysical impacts of the project, following the adoption of a number of design and operational procedures, mitigation measures and/or offset strategies. Assuming the commitments made by Rocla in Section 6 are adhered to, these residual impacts are summarised as follows.

Topography

As a result of the proposed sand extraction and replacement of silt within the final landform, the Project would result in localised modification of the Project Site topography. The long term rehabilitation of the Project Site incorporating landform reconstruction would create a final landform providing for ongoing commercial activity in the Stage 4 area and long term nature conservation in the Stage 5 area.

Groundwater Resources

The groundwater resources of the Central Coast are located within two principal geological units, namely the Hawkesbury Sandstone and the underlying Terrigal Formation. Within the Calga area, groundwater is largely derived from rainfall infiltrating the friable sandstone exposed at or near the ground surface and accessed primarily from the Hawkesbury Sandstone, typically between approximately 10m and 140m below surface.

Within a 3.0km radius of the Project Site, 26 groundwater bores were identified with yields of typically 2L/s or less. The bulk of the water pumped from groundwater bores in the Calga area is used for stock and domestic uses, although there are several nearby bores which are licenced for commercial groundwater extraction.

A groundwater model was developed based on a number of years of regular and continuous data collection from piezometers located to the north and south of the existing Calga Sand Quarry and at least eight of the licenced bores surrounding the Project Site (Geoterra, 2008). Modelling the development of the Project at the end of Stage 3, Stage 4, Stage 5 and the final landform determined that the predicted draw down in the majority of the privately owed bores would not exceed 1m. One bore was predicted to experience a drawdown of approximately 4m, although this would still leave an available drawdown or saturated thickness in the bore of approximately 20m. It is not anticipated that the Project would have any noticeable effect on the yields of these licenced bores.

While there are no specific mitigation measures to counteract impacts on groundwater drawdown, Rocla has committed to a comprehensive monitoring program to assess progressive impacts. In the event that a reduction in bore yield can be attributable to the Project operations, Rocla proposes to 'make good' any significant losses in groundwater availability to local groundwater users.

As a result of extraction below the groundwater table, water would seep into the extraction areas void. The groundwater modelling conducted by Golder Associates in conjunction with Geoterra Pty Ltd predicted that this in-flow of water would approximate 28ML at the completion of Stage 3, 139ML at the completion of Stage 4 and 161ML at the completion of Stage 5. These predictions are likely to overestimate the actual inflow volume as the modelling was not developed transiently, ie. the model assumes the entire extraction stage is removed at once which would create an artificially high pressure differentiation and therefore higher flow rates. Under the *Water Management Act 2000*, a Water Access Licence (WAL) is required to extract groundwater. Rocla has agreed to purchase a WAL allocation of 46ML (in addition to the 6ML allocation of 20WA100255 which is assigned industrial usage on Lot 2, DP229889), with additional allocation to be obtained following further investigations to more accurately identify the volume of groundwater that is expected to flow into the extraction areas.

Overall, the groundwater assessment has established that the groundwater impacts would be localised and that there are opportunities for Rocla to compensate for any losses any surrounding land owner experiences as a result of the Project proceeding.

Surface Water Resources

Despite the topographic and geomorphic changes resultant from the Project, the volume of water discharged from the Project Site to the Cabbage Tree Creek catchment would not vary significantly from current flows.

Assuming the construction and maintenance of the proposed water control structures, the Project would not have any adverse impact on local water quality.

Flora and Fauna

The proposed Southern Extension would result in the clearing of approximately 36.6ha of native vegetation (and an additional 2.8ha of previously disturbed land). Impacts on the most sensitive areas of vegetation, eg. those providing important habitat for threatened species, were avoided as far as practicable. A summary of the Project-related vegetation clearing is as follows.

- Stage 4 would result in the clearance and removal of approximately 22.2ha of native vegetation consisting mostly of native forest and woodland. This is approximately 26.6% of the vegetated areas.
- Stage 5 would result in the clearance and removal of an additional 11.4ha (13.6%), bringing the total cleared to 33.6ha or 39.9% of the vegetated areas.
- Internal access roads would result in the clearance and removal of an additional 1.1ha (1.4%), bringing the total cleared to 34.7ha or 41.6% of the vegetated areas.

- The vegetation communities that would experience the greatest proportional losses through vegetation clearing are those in the upper portions of the Project Site:
  - E26 group Exposed Hawkesbury Woodland (39.8% cleared);
  - E29 group Hawkesbury Banksia-Scrub Woodland (56.7% cleared); and
  - E103 Gahnia/Banksia Swamp (which would be totally cleared by Stage 4).
- E2 Sandstone Ranges Gully Rainforest and E54 Sandstone Hanging Swamp would not be directly affected by clearing of vegetation.

The vegetation of the Project Site to be cleared is typical of the vegetation found elsewhere in the Hawkesbury Sandstone environments on the Somersby Plateau (Cumberland, 2009). Notably, the Project would not result in the clearance of any areas of "high conservation value" (Cumberland, 2009), nor either of the two communities considered regionally significant by LHCCREMS (2003) (Sandstone Hanging Swamps (MU54 – equivalent to E54) and the Sandstone Ranges Warm Temperate Rainforest (MU2 – equivalent to E2)).

The impact of the proposed clearing on the distribution of native vegetation would be partially mitigated by the proposed rehabilitation of the Stage 5 extraction area to native vegetation. As noted above, the high resilience of the Exposed Hawkesbury Woodland and Hawkesbury Banksia-Scrub Woodland vegetation communities should accelerate the successful re-establishment of these communities within the final landform.

The impacts of clearing will be further offset by the establishment of the proposed biodiversity offset strategy. This strategy provides for the conservation of undisturbed native vegetation over 39.1ha of the Project Site and 44.7ha on a section of the adjoining "Glenworth Valley" property (see Section 2.14.2). The vegetation to be conserved includes:

- 1.3ha of Sandstone Ranges Gully Rainforest (E2);
- 3.3ha of Dharug Footslopes Apple-Redgum Forest (E20);
- 30.5ha of Hawkesbury Peppermint Apple Forest (E25);
- 32.3ha of Exposed Hawkesbury Woodland (E26);
- 7.0ha of Hawkesbury Banksia-Scrub Woodland (E29); and
- 2.0ha of Sandstone Hanging Swamp (E54).

The total conservation : disturbance ratio (83.8ha:34.7ha) exceeds 2:1, improving to 2.75:1 if the rehabilitated Stage 5 extraction area is included.

While the area of each vegetation community cleared on the Project Site is relatively small, the significance of this clearing needs to be considered in a regional context, ie. what proportion of this vegetation community in the region does this area represent. With the exception of Gahnia/Banksia Swamp (E103), of which it was not possible to determine the proportional clearing due there not being reliable records of regional distribution, the native vegetation to be cleared on the Project Site represents less than 1% of the known extent of the vegetation community in the region. Therefore, the regional significance of the proposed clearing is considered minor and would be more than adequately compensated by the establishment of the proposed biodiversity offset strategy which would ensure the long-term security of a wildlife / habitat corridor between the Popran and Brisbane Waters National Parks within the region.

Aboriginal Heritage

Several Aboriginal sites were identified on the Project Site. Notably, however, Rocla has modified the boundaries of the proposed extraction areas to ensure none of the sites are disturbed by the proposed extraction and associated activities.

Noise

The Project has been designed with consideration given to minimising noise impacts on surrounding properties and noise modelling has predicted that with the implementation of noise controls (including the establishment of acoustic bunds around each extraction stage), operational noise levels would comply with the nominated criteria (based on measured rating background noise levels).

Maximum night time noise levels would comply with the nominated criteria at all residences.

Traffic noise criteria would not be exceeded during both the night time and daytime periods.

Air Quality

The air quality assessment concluded that assuming the implementation of the Project design features, operational safeguards and mitigation measures summarised in Section 5.7.5 the potential impact on air quality at surrounding residences would be minor and would not exceed the recommended air quality goals. Specifically, the air quality modelling determined:

- incremental monthly dust deposition rates are predicted to be well below the 2.0g/m^2/month at all assessment locations;
- the incremental contribution of the Project to maximum 24-hour average PM_{10} concentrations are predicted to be less than the site specific goal 50µg/m^3 at all assessment locations;
- the probability that the cumulative maximum 24-hour average PM_{10} concentrations would be exceeded as a consequence of the Project was predicted to increased by between 0.27% and 0.31%, which may therefore result in 1 extra day where the criterion is exceeded;
- the annual average PM_{10} concentrations are predicted to be less than the site specific goal 30µg/m^3 at all assessment locations;
- neither the Chronic Reference Exposure Level (REL) or Silicosis Potency criteria are predicted to be exceeded as a result of project dust / particulate emissions at either of the most affected residences;
- time weighted average concentrations for respirable silica would be below OHS goals; and
- all project air quality goals relating to SO_2 and NO_2 would be safely met.

Transportation

Assuming a linear traffic growth of 2% on Peats Ridge Road the Project would increase traffic by 6.4%, with an increase in the proportion of heavy vehicles increasing by 2.6%. While the estimated maximum hourly weekday traffic volume on Peats Ridge Road is expected to increase from 168vph in 2006 to around 218vph in 2012 (an increase of 30%), TUP (2008) consider this still represents a relatively low two way traffic volume for a divided two way rural road, especially considering the separate entrance and exit arrangement proposed by Rocla.

TUP (2008) calculate the Project would result in traffic on the F3 Freeway increasing by less than 15 on an average weekday.

While the Project would increase the number of heavy vehicles entering and using Peats Ridge Road, the Pacific Highway and the F3 Freeway, there is unlikely to be any detrimental impact on road safety given:

- there is no treatable pattern or single treatable location where recorded accidents occur on these roads;
- all of the roads to be used are engineered to current standards with the RTA currently improving the F3 Freeway to provide additional lanes and capacity between Gosford and Wahroonga;
- the proposed changes to Calga Sand Quarry vehicle access from Peats Ridge Road would be designed and constructed to RTA standards; and
- a Code of Conduct, stipulating safe driving practices at all times, has been successfully implemented to date for all employees and truck drivers.

Soils and Land Capability

The management of the soil resource have been designed to ensure their proper handling and to provide the maximum opportunity for its re-use in the successful rehabilitation of the Project Site. These practices have been developed based on the operating experience gained to date on the Project Site, and have been shown to be successful. As such, the impact associated with topsoil/subsoil removal, storage and re-use is anticipated to be minimal.

Considering the immediate transfer of topsoil and other soil management controls to be implemented, it is assessed that the impact on the soil resource would be moderate and temporary.

7.3.3 Socio-economic Considerations

While all the impacts summarised in Section 7.1.1 have been assessed to comply with nominated criteria or meet accepted environmental standards, the cumulative effect of these minor impacts may have some adverse effect on the amenity of the local setting. When considering impacts on local amenity, it is notable that the existing Calga Sand Quarry has operated in its current location for over 10 years, with minimal impact on the local community. As an extension of this existing operation, Rocla would not be exposing a community to a new activity, rather the existing operations which are a feature of the local setting would be extended.

Importantly, the Project is not assessed as having any adverse impacts on the local land uses surrounding the Project Site. In particular, the Project would not draw down the groundwater such that the commercial mineral water extraction and bottling operation would be affected. There would be minimal changes to local noise, dust and groundwater levels minimising any effect on the local rural/residential properties. The native vegetation buffer created by the establishment of the biodiversity offset strategy would minimise any impact on the adjoining Popran National Park. And finally, while Stage 5 of the Project would be considerably closer to the Australia Wildlife Walkabout Park, existing topography and vegetation would obscure this from the majority of the park, with the conservation and tourist objectives of the Australia Wildlife Walkabout Park unlikely to be significantly affected.

The Project would also provide several benefits to the local and regional socio-economic setting which include the following.

- An increase in direct full-time employment from 8 up to 19 people which would preferentially be sourced from the local area or wider Central Coast. Increased employment opportunities would have additional flow-on benefits including:
  - the provision of new and/or continued employment would provide an impetus to other local businesses;
  - quarry expenditure on fuel, parts and consumables; and
  - support of local community services and projects.
- The Calga Sand Quarry would continue to provide for locally produced sand products which, due to the reduced travel distance, would be likely to be significantly less expensive for customers on the Central Coast than materials sourced from Sydney or Newcastle.
- The proposed final landform would provide opportunity for the continuation of employment generating activities.
- The continued diversification of development / industry in the LGA would lead to increased training opportunities for the residents of the LGA.

The socio-economic benefits of the Project would also flow onto the Sydney metropolitan area given that the Calga Sand Quarry would provide for the continued production of a resource likely to be in short supply over the next three to five years. By easing the potential shortage of sand products, potential increases in the cost of construction materials, eg. concrete could be avoided with the obvious benefits to the housing market.

Based on the experience of the existing Calga Sand Quarry, including the most recent northerly extension (Stage 3), as well as experience at other similar sites, the perceived impact of the proposed extension on local amenity and the socio-economic setting is generally far greater than the actual impact. While significant local opposition to the Stage 3 extension of the Calga Sand Quarry was received on the basis of the perceived impacts on the local setting, since commencement, there has been very little complaint from the local community. Rocla recognises this does not obfuscate it from its responsibility to manage the Project to minimise all environmental impacts, but demonstrates that the quarry and the local community can co-exist harmoniously.

7.3.4 Planning Considerations

This section considers the permissibility of the Project and compliance with the relevant State Environmental Planning Policies.

Permissibility

As noted in Section 3.2.4.3, an extractive industry is permissible within the Project Site by virtue of Gosford/Wyong LEP 2001, which confirms the designated preferential use of land on which the Project Site is located as "*location of extractive industry*".

State Environmental Planning Policy (SEPP) (Mining, Petroleum Production and Extractive Industries) 2007

The SEPP specifies matters requiring consideration in the assessment of any mining, petroleum production and extractive industry development, as defined in NSW legislation. **Table 7.2** presents a summary of each element requiring consideration and a reference to the section in the *Environmental Assessment* where this is addressed.

Table 7.2
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

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Relevant SEPP Clause	Description	EA Section
12: Compatibility with other land uses	Consideration is given to:	
	- the existing uses and approved uses of land in the vicinity of the development;	4.3
	- the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and	5.10
	- any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.	5.10
	The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared.	5.13.4, 7.3.3
	Measures proposed to avoid or minimise any incompatibility are considered.	Throughout Section 5
13: Compatibility with mining, petroleum production or extractive industry	Consideration is given to whether the development is likely to have a significant impact on current or future mining, petroleum production or extractive industry and ways in which the development may be incompatible.	1.4.2, 5.13.4
	Measures taken by the applicant to avoid or minimise any incompatibility are considered.	n/a
	The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	5.13.4, 7.3.3

Table 7.2 (cont'd)
Application of SEPP (Mining, Petroleum Production and Extractive Industries) 2007

Relevant SEPP Clause	Description	EA Section
14: Natural resource and environmental management	Consideration is given to ensuring that the development is undertaken in an environmentally responsible manner, including conditions to ensure:	
	- impacts on significant water resources, including surface and groundwater resources, are avoided or minimised;	5.1, 5.2
	- impacts on threatened species and biodiversity are avoided or minimised; and	5.3.7.5
	- greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	5.7.7.3
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	Section 2
16: Transportation	The following transport related issued are considered.	
	- The transport of some or all of the materials from the site by means other than public road.	n/a
	- Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.	5.8.4
	- The preparation of a code of conduct for the transport of materials on public roads.	5.8.4
17: Rehabilitation	The rehabilitation of the land affected by the development is considered including:	
	- the preparation of a plan that identifies the proposed end use and landform of the land once rehabilitated;	2.13.3, 2.13.4
	- the appropriate management of development generated waste;	2.11
	- remediation of any soil contaminated by the development; and	5.9.4
	- the steps to be taken to ensure that the state of the land does not jeopardize public safety, while being rehabilitated or at the completion of rehabilitation.	5.12

State Environmental Planning Policy No. 33 (SEPP 33) – Hazardous and Offensive Developments

Based on the risk screening method of DUAP (1997), neither the storage nor transport of the hazardous materials to be stored on the Project Site would result in the Project being considered a hazardous, offensive or potentially hazardous under SEPP 33.

State Environmental Planning Policy No. 44 (SEPP 44) – Koala Habitat Protection

SEPP 44 has been addressed by the fauna consultant to the Project (Cumberland Ecology, 2009 - see *Specialist Consultant Studies Compendium* - Part 3). By applying the SEPP 44 definition, the Project Site consists of Potential Koala Habitat but because it does not show signs of use by any Koalas, it does not qualify as Core Koala Habitat. According to the Koala Recovery Plan, the type and density of feed trees would indicate that the Project Site could only support low densities of Koalas (in the order of <1 per hectare) (see Section 5.13.4.2).

7.3.5 Consequences of not Proceeding with the Project

The consequences of not proceeding with the Project include the following.

i) The opportunity to establish a long term supply of sand products would be foregone. This would place additional pressure on existing resources and ultimately lead to increased production at these sites.

ii) It would lead to the development of other greenfield quarry sites, possibly in less appropriate locations on the Somersby Plateau.

iii) The opportunity to increase employment opportunities in the local area would be foregone. This would also impact on the economic activity of the local community and the Gosford City LGA.

iv) The long-term conservation of native vegetation within the proposed biodiversity offset strategy would be foregone.

v) The various impacts identified throughout Section 5 of this document would not occur.

The benefits of proceeding with the proposed Southern Extension of the Calga Sand Quarry are considered to outweigh the predicted impacts on the environment that would result if the Project is approved. The consequences of not proceeding with the Project also weigh heavily in favour of proceeding with the Project.

7.4 CONCLUSION

The proposed Southern Extension of the Calga Sand Quarry has been designed to, as much as possible, address the issues of concern to the community and all levels of government. The Project provides for the recovery of valuable sand resources which are significant in the planning of resources available to the Sydney and Central Coast markets. The subsequent landform, created by the deposition, consolidation and capping of silt materials with limited quantities of overburden, subsoil and topsoil, would be constructed to sustain a combination of agricultural, horticultural or other commercial activity (Stage 4) and native vegetation conservation (Stage 5).

This document and the range of specialist consultant studies undertaken have identified that the Project should proceed because it would:

i) satisfy the demand for sand products and introduce a level of certainty for supply;

ii) satisfy sustainable development principles;

iii) operate with risks to the local environment minimised through Project design and implementation of a range of environmental controls and safeguards;

iv) have a minimal and manageable impact on the biophysical environment;

v) have a minimal adverse impact on the biophysical environment, with substantial positive impacts likely for the wider regional and NSW socio-economic environment;

vi) contribute to the continued economic activity of the Gosford City LGA; and

vii) provide a site suitable for future agricultural, horticultural or other commercial activities compatible with surrounding land uses.