Section 6
Evaluation and Justification of the Project

This section concludes the assessment of the proposed Narrabri Coal Project. The key assessment requirements (identified by 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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6.1 INTRODUCTION

As a conclusion to the *Environmental Assessment*, the development and operation of the Narrabri Coal Project is evaluated and justified through consideration of its potential impacts on the environment and potential benefits to the local and wider community.

Project evaluation has been undertaken by firstly reassessing of the risks posed to the local environment by project activities, and then considering the implementation of the commitments for controls, safeguards or mitigation measures 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 6.3, 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.

6.2 EVALUATION OF THE PROJECT

6.2.1 Residual Environmental Risk and Impacts

Following consideration of the proposed operational safeguards, controls and mitigation that would be implemented by the Proponent as part of the project design, **Table 6.1** reassesses the 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 6.1
Analysis of 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
Surface Water / Flooding					
Reduced natural surface water flows	Stressing of downstream native vegetation due to restricted flows.	M	2	E	L
	Reduced productivity of downstream grazing lands.	L	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 saline water.	H	4	-	
	Continuing discharge of contaminated water resulting in ongoing degradation of water quality in local creeks and tributaries, eg. frequent/periodic discharge of saline or dirty water.	E	2	C	M
	Isolated and major event resulting in temporary but wider spread degradation of water quality, eg. discharge of hydrocarbons reaching Namoi River.	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

Table 6.1 (Cont'd)
Analysis of 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
Surface Water / Flooding (Continued)					
	Repeated major event resulting in long-term and wide spread degradation of water quality, eg. continued discharge of saline water reaching the Namoi River.	E	3	E	M
Changes to local flooding patterns and indirect impacts on native vegetation communities and ecosystems.		H	3	E	M
Erosion and Sedimentation					
Soil erosion	Minor gully erosion of drainage lines, stockpiles or created slopes.	H	2	D	L
	Minor sheet or gully erosion of rehabilitated landform.	M	2	D	L
	Major gully or sheet erosion formation.	H	3	E	M
Sediment Load and Turbidity	One-off discharge of dirty water from the Project Site.	H	2	D	L
	Regular discharge of dirty water from the Project Site.	H	3	E	M
Groundwater					
Groundwater Pollution by leaking/spilt hydrocarbon	Contamination requiring minor recovery works.	M	1	D	L
	Contamination requiring major recovery works.	H	3	E	M
Drawdown of groundwater within the aquifers of the GWMA's considered	Reduced water levels within the aquifers of the Great Artesian Basin GWMA reducing recharge to this GWMA.	H	3	D	M
	Reduced water levels within the aquifers of the Gunnedah Basin GWMA.	H	1	B	M
	Reduced water levels within the aquifers of the Upper Namoi GWMA.	H	3	E	M
Reduction in groundwater bore yields	Impacts restricted to groundwater bores on the Project Site, or Proponent owned land.	H	1	C	L
	Reduction in yield of <15% of non-project related bores.	H	1	B	M
	Reduction in yield of >15% of non-project related bores.	H	2	B	H
Impacts on Groundwater Dependent Ecosystems.		M	-	E	
* Impacts resultant from uncontrolled discharges of dewatered mine in-flows are considered as part of the Surface Water / Flooding and Drainage section of the risk analysis.					
Threatened Flora and Fauna					
Loss of, or alteration to, existing habitats.	Disturbance to native vegetation / habitat within nominated areas.	H	1	B	L
	Disturbance to native vegetation / habitat outside nominated areas.	M	2	D	L
Direct adverse impact on threatened species.	Disturbance to Threatened flora / fauna and endangered communities.	H	3	E	M
	Disturbance leading to local population reduction.	H	3	E	M
	Disturbance leading to local extinction(s).	E	5	-	
Reduced biodiversity	Local biodiversity.	M	3	-	
	Regional biodiversity.	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

Table 6.1 (Cont'd)
Analysis of 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
Aboriginal Heritage					
Impact on identified sites and/or artefacts of Aboriginal cultural heritage as a result of the proposed construction and mining activities and without the permission of LALC or DEC.		E	4	E	H
Impact on unidentified sites and/or artefacts of Aboriginal cultural heritage as a result of subsidence and without the permission of LALC or DEC.		H	3	D	M
Soil and Land Capability					
Insufficient soil quantities for rehabilitation.		H	3	-	
Reduced soil quality	Reduced soil quality.	M	1	B	M
	Degradation of soil quality.	M	2	D	L
Elevated erosion or erosion potential.		M	2	D	L
Decreased land and agricultural capability of the final landform.		H	2	E	L
Visual Amenity					
Reduced amenity of altered Project Site landform	Temporary disturbance to landform.	H	1	A	H
	Marginally identifiable change to landscape.	H	1	A	H
	Highly identifiable change to landscape.	H	2	D	L
Impacts on the effectiveness of the Siding Springs Observatory.		L	-	-	
Rehabilitation, Final Landform & Biodiversity Offsets					
Reduced access to agricultural lands.		M	2	D	L
Increase in areas designated for native vegetation conservation.		n/a	n/a	n/a	n/a
Air Quality					
Nuisance - deposited dust	Deposited dust levels attributable to the project occasionally (for one or two months every year) above DEC guideline, affects only adjacent landholders.	M	2	D	L
	Deposited dust levels attributable to the project regularly (exceedances greater than DEC guideline for >5 months per year) above approved limit, affects landholders some distance from Project Site.	H	3	E	M
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	D	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
Ventilation of Saline Water resulting in impacts on vegetation	Restricted to predominantly non-native vegetation within immediate vicinity of ventilation shaft.	M	2	E	L
	Impacts on native vegetation extending beyond immediate vicinity of ventilation shaft.	H	3	E	M
	Impacts extend beyond the Project Site or impact on extensive areas of native vegetation.	H	4	-	
Greenhouse Gas Emissions.		M	1	B	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

Table 6.1 (Cont'd)
Analysis of 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
Traffic and Transport					
Increased traffic congestion.		M	2	E	L
Road pavement deterioration.		H	2	E	L
Elevated risk of accident/incident on local roads	Minor accident - no injury.	M	2	D	L
	Minor accident - minor injury.	M	3	E	M
	Major accident -moderate injuries requiring hospitalisation.	H	4	E	H
	Severe accident - severe injuries or death injury.	H	5	E	H
Elevated risk of rail related accident/incident	Minor accident - no injury.	L	2	E	L
	Minor accident - minor injury.	M	3	E	M
	Major accident -moderate injuries requiring hospitalisation.	H	4	E	H
	Severe accident - severe injuries or death injury.	H	5	E	H
Noise and Vibration					
Increased noise levels associated with Project Site activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A))	M	2	D	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	D	L
	Regular marginal exceedance of noise criteria (3-5dB(A))	M	3	E	M
	Occasional major exceedance of noise criteria (>5dB(A))	M	2	E	L
	Regular major exceedance of noise criteria (>5dB(A))	M	3	E	M
Increased noise / vibration levels associated with project road and rail traffic activities causing annoyance, distractions, ie. amenity impacts.	Occasional minor exceedance of noise criteria (1-2dB(A))	M	2	D	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	D	L
	Regular marginal exceedance of noise criteria (3-5dB(A))	M	3	E	M
	Occasional major exceedance of noise criteria (>5dB(A))	M	2	E	L
	Regular major exceedance of noise criteria (>5dB(A))	M	3	E	M
Maximum noise levels resulting in sleep disturbance.		M	2	E	L
Increased noise levels associated with the project leading to reduced production, ie. impacts on livestock.		M	2	E	L
Structural damage to buildings and structures		M	2	E	L
Nuisance/amenity impacts on surrounding landowners / residents		M	2	E	L
Reduced agricultural production		M	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

Table 6.1 (Cont'd)
Analysis of 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
Subsidence					
Damage to buildings / structures		M	2	E	L
Impacts on surface and groundwater flows		M	2	E	L
Increased erosion potential		L	2	E	L
Decreased agricultural value of affected land		L	2	E	L
Damage to Aboriginal artefacts		M	3	D	M
Waste Management and Land Contamination					
Contamination by waste oil.	Contamination requiring minor recovery works	L	2	E	L
	Contamination requiring major recovery works	M	3	E	M
Acid generation from overburden used in construction of bunds and Pit Top Area structures.		M	3	-	
Reduced amenity of Project Site due to poor rubbish, litter management		L	1	D	L
Transfer of contaminated material	Small area affected (<0.01ha)	L	2	D	L
	Large area affected (>0.01ha)	M	3	E	M
Contamination of surface water as a result of exposing contaminated lands	Minor and temporary contamination of water quality in local creeks and tributaries	M	2	E	L
	Minor and continuing contamination of water quality in local creeks and tributaries	M	3	E	M
	Major and temporary contamination of water quality in local creeks and tributaries	M	3	E	M
	Major and continuing contamination of water quality in local creeks and tributaries	H	5	-	
Spontaneous Combustion					
Injury sustained as a consequence of fire	Minor injury	L	2	E	L
	Moderate injury requiring first aid	M	3	E	M
	Injury requiring hospitalization	H	4	E	H
	Severe injury or death	H	5	E	H
Impacts on native flora and fauna in the event of fire spreading beyond coal stockpiles	Small fire within Project Site	L	2	E	L
	Moderate fire extending beyond the Project Site	M	3	E	M
	Large fire extending far beyond the Project Site	H	4	E	H
Socio-Economic Impacts and Property Values					
Improved economic activity and related social impacts attributable to reduced unemployment		n/a	n/a	n/a	n/a
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	3	E	M
	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

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 4B determined the likelihood to be so low, or consequence so insignificant, as to be virtually non-existent. This approach was taken generally 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.

- Reduction in yield of >15% of non-project related bores.

  Groundwater modelling predicted that three non-project related bores would suffer a decrease in saturated thickness of greater than 15%. This may result in the yield decreasing by a similar proportion. While a high risk is allocated given the impact is likely (based on modelling), agreements would be reached with the effected bore owners to mitigate the impacts.

- Impact on identified sites and/or artefacts of Aboriginal cultural heritage as a result of the proposed construction and mining activities and without the permission of LALC or DEC.

  The accidental disturbance to an identified Aboriginal artefact or site cannot be categorically ruled out and therefore, even though the potential likelihood is considered rare, as the potential consequence is major, a high risk rating is retained.

- 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.

- Major or severe accident resultant from road or rail 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.

- Major or severe injury sustained as a consequence of spontaneous combustion related fire.

  As above, while the likelihood of such an occurrence is reduced to rare through the implementation of project safeguards, the potential consequence of a major or severe accident is such that a high risk rating applies.

- Impacts on native flora and fauna as a consequence of a bushfire extending well beyond the limits of the Project Site.

  While considered 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 generally considered acceptable.

6.2.2 Ecologically Sustainable Development

6.2.2.1 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 a decade 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.

6.2.2.2 The Precautionary Principle

To satisfy this 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*, the Proponent 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, the Proponent and its consultants have adopted an anticipatory approach to impacts, particularly that of irreversible ecological damage, by undertaking an analysis of the risks posed by activities of the project, an appropriate level of research and baseline investigations and environmental evaluation. 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 the Proponent as the draft statement of commitments presented as Section 5.

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 mine in a safe and environmentally responsible manner which meets the requirements of local and State government agencies, accepted industry standards and wherever possible, reasonable community expectations. The Proponent recognises that only through comprehensive environmental assessment and an environmentally responsible approach to the design and operation of the proposed development can the risk of harm to the environment be minimised.

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 location of the Pit Top Area and facilities contained was chosen to minimise disturbance to native vegetation and the riparian zones of several ephemeral creeks which traverse the Project Site, eg. the rail loop was oriented to minimise impact on the flooding zone of Kurrajong Creek Tributary 1.
- The orientation of the Site Access Road was re-aligned to avoid the crossing of Kurrajong Creek Tributary 1.
- In order to prevent the discharge of saline water from the Pit Top Area, a series of evaporation / storage ponds, large enough to manage the dewatering of mine in-flows, have been incorporated into the design of the project. Furthermore, the Proponent has committed to construct and operate a water conditioning plant to treat any excess quantities of saline water pumped from the underground mine throughout the project life.
- A perimeter amenity bund was designed to maximise the use of mined rock from the box cut required while visually screening the Pit Top Area activities from neighbouring residences.
- The location of the Ventilation Shaft Area was chosen to provide natural shielding by existing native vegetation. On identifying the saline nature of water that would be encountered by the underground workings, the Proponent has committed to the installation of a dewatering screen to prevent the discharge of saline mist to the surrounding vegetation.
- The final landform was designed to provide for the re-establishment of considerable areas of land suitable for grazing whilst integrating the conservation of areas of native vegetation and potential ongoing use of the rail loop for a subsequent development.

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 and be managed in accordance with the DPI (MR) Mining, Rehabilitation and Environmental Management Process, both of which would involve the input from relevant State and local government agencies. The Mining Operations Plan, which would contain a range of site specific environmental procedures to achieve consistency with specified outcomes and to control identified risks, would be updated periodically, while the Annual Environmental

Management Report 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, and deposited dust levels would be monitored at locations potentially most affected by the project in order to ensure the continued compliance with the goals outlined in this document;
- the principles outlined in the surface water management section of the Environmental Assessment (Section 4B.1.4) would be adopted to minimise any impact on water quality or quantity exiting the Pit Top Area;
- wherever possible, areas not required for mining-related activities would remain grassed 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 (as indicated by the soil mapping unit), 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 a landform suitable for future use for agriculture and the establishment / maintenance of areas of native vegetation.

Conclusion

The precautionary principle has been considered during all stages of the design and assessment of the Narrabri Coal Project. The approach adopted, ie. risk analysis, 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.

6.2.2.3 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 project has been designed with the objective of providing significant employment opportunities to residents of the Narrabri and Gunnedah Shires. This objective would require a commitment to employee training. Consideration has also been given to the ability of the Narrabri Shire to accommodate a development of the scale proposed.

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

Design of Project Components

The project has been designed to maintain inter-generational equity, ie. in recognition that mining is a relatively 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 location and orientation of the Pit Top Area has been designed to minimise disturbance upon native vegetation and sensitive fauna habitats.
- The location and orientation of the Pit Top Area has been designed to ensure that disturbance to Aboriginal heritage sites would be avoided.
- The availability of groundwater to surrounding landholders, although not predicted to be noticeably affected by the project, would be monitored throughout the life of the project and compensatory measures taken should a short-term reduction in the availability of groundwater to local landholders occur.
- The rehabilitation of the Project Site has been designed to integrate the re-establishment of agricultural land with the conservation of native vegetation.

Integration of Safeguards and Procedures

Local community stakeholders were consulted to ensure adequate facilities and an appropriate level of services would be available to the project and project employees such that access of the local community to these facilities and services could be maintained.

The Proponent recognises that all members of the local Narrabri and Baan Baa communities should benefit appropriately from the project either directly or indirectly. In order to ensure a realistic distribution of benefits, the Proponent 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 final landform would be constructed and rehabilitated in a manner that would generally retain land with an agricultural capability similar to that prior to mining, thereby providing the basis for continuing economic activity within the local community. The intention to retain the rail loop within the rehabilitated landform would provide an important item of infrastructure for a subsequent industry.

Conclusion
The principle of social equity has been addressed throughout the design of the project. The Narrabri Coal Project would contribute significantly to the economic activity of Narrabri and the communities of the Narrabri Shire through the generation of employment and increased demand for local goods and services and flow-on effect. 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 agricultural land, water and local biodiversity would continue to be available to future generations. The Proponent would adopt a pro-active approach in identifying and addressing any concerns identified by the local community.

6.2.2.4 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 adversely affect biological diversity or ecological integrity. As such, the project has been designed with an objective to minimise impacts on the flora and fauna of the Project Site, whilst allowing the extraction of an economically viable resource.

Design of Project Components

- Water management structures have been designed and would be constructed to ensure that only water within DEC specified criteria leaves the Pit Top Area.
- The orientation of the rail loop and Site Access Road would minimise disturbance to the more sensitive communities of the Kurrajong Creek tributaries.

Integration of Safeguards and Procedures

- Pre-clearing surveys of native tree species would be undertaken and any threatened species encountered would be relocated prior to clearing.
- Cleared vegetation <300mm in diameter or containing hollows would be retained and used in the rehabilitation of areas designated for native vegetation re-establishment.
- Post-mining rehabilitation of the Pit Top Area would include the establishment of some native vegetation.
- Weed eradication programs would be developed and implemented, as required.

Rehabilitation and Subsequent Land Use
The final landform has been designed primarily to provide for some agricultural activity but with the establishment of some native vegetation and fauna habitat included.

Conclusion
The project would have little impact on local or regional biodiversity. This notwithstanding, disturbance to areas of native vegetation would be minimised wherever possible. Weed eradication programs would be implemented as appropriate and would further assist in addressing the principle of sustainable development.

6.2.2.5 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 proposed Narrabri Coal Project is set out below.

Identification of Project Objectives
The Proponent's principal objective is to operate the mine 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 coal to be mined, is evidence of the value placed by the Proponent on these resources.

Rehabilitation and Subsequent Land Use
The design of the final landform to integrate ongoing agricultural activities with the re-establishment of native vegetation illustrates the value placed by the Proponent on both the agricultural and ecological elements of the Project Site.

Conclusion
The value placed by the Proponent 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 coal would be sufficient to enable the Proponent to achieve an acceptable profit level whilst undertaking all environmentally-related tasks and meeting all commitments in all the project approval, leases and licences and those made to the local community.

6.2.2.6 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 Narrabri Coal Project achieves a sustainable outcome for the local and wider environment.

6.3 JUSTIFICATION OF THE PROJECT

6.3.1 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, Narrabri and Narrabri Shire, NSW and Australia. When considering the predicted residual impacts, a review of the proposed controls, safeguards and mitigation measures of the Proponent 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.

6.3.2 Biophysical Considerations

Sections 4B.1 to 4B.7 present the range of residual impacts on the biophysical environment predicted should the project proceed, after the adoption of a number of design and operational procedures, mitigation measures and/or offset strategies. The project would have a range of impacts on the biophysical environment. The residual impacts considered of greatest significance, and the proposed management of these, are summarised as follows.

Water Resources
A proportion of the surface water currently flowing through the Pit Top Area would be retained on site for use in dust suppression. The "clean" water component captured would be within the maximum harvestable right for the Project Site, with additional clean water diverted to natural watercourses. Sediment-laden or "dirty" water originating from disturbed areas would be collected and preferentially used for dust suppression. Any excess dirty water would be retained to allow sufficient time for suspended solids to settle out and enable it to be discharged within DEC criteria. Project operations would also require that significant volumes of potentially saline water produced by mine in-flows, be managed on the surface and prevented from entering the natural drainage network.

During the life of the project, the groundwater level within several of the lower geological formations would be lowered. However, as the water in these layers is not generally accessed by local groundwater users, a significant impact was predicted in only three non-project related registered bores within 5km of the Project Site.

Soils and Land Capability

Impacts on the soils of the Project Site would be temporary and manageable given the procedures intended to stockpile and revegetate all soils.

Flora and Fauna

Disturbance to native vegetation and fauna habitats would be limited given the largely cleared nature of the Project Site and avoidance of disturbance to the more sensitive communities in close proximity to the tributaries of Kurrajong Creek.

Aboriginal Heritage

There would be no disturbance to any of the Aboriginal heritage sites identified on the Project Site. The Proponent is committed to ensuring that any artefacts or sites of Aboriginal heritage significance that may be identified in the future are appropriately protected and/or managed.

Noise

The project would generate noise levels over and above those currently experienced throughout the existing environment. These noise levels, assuming the implementation of the operational commitments identified in Section 5, would remain within the DEC nominated criteria for all operational activities.

Air Quality

Air pollutant levels are predicted to be below DEC criteria for deposited dust, PM_{10} and $PM_{2.5}$ at all non-project related residences, ie. assuming the adoption of a range of standard dust control measures. Similarly, SO_2 and NO_2 emissions would satisfy DEC and Heritage, WHO and NEPC criteria and greenhouse gas emissions would only lead to a minor increase in Australia-wide and International emissions.

Visibility

Activities on the Project Site would represent a minor change to the existing visual amenity although the construction and vegetation of amenity bunds around the Pit Top Area and Ventilation Shaft Area would largely mitigate this change.

Traffic

Traffic would not increase noticeably on the Kamilaroi Highway although there may be occasional delays caused to traffic on Kurrajong Creek Road due to the short term (<6 minutes) closure of the railway level crossing to allow the entry or exit of coal trains onto or off the rail loop. An appropriate intersection would be constructed to ensure the storage of vehicles on the Kamilaroi Highway at these times does not compromise the safety of road users.

When considering the implementation of the controls, safeguards and mitigation measures proposed by the Proponent and summarised in Section 5, the level of impact on the biophysical environment is relatively minor. The relatively minor impact is further emphasised when compared to operating coal mines elsewhere which require disturbance to larger areas of native vegetation, are in closer proximity to local communities and require disturbance to items of Aboriginal or European heritage significance.

6.3.3 Socio-economic Considerations

The impacts of the project on the socio-economic environment would be largely positive given the significant increase in employment opportunities, the Proponent's commitment to employing local residents, the diversification of industry within the Narrabri Shire and the flow-on effects to subsidiary and associated industries and businesses of the project.

While a short term tightening of the rental market in Narrabri may be experienced, Narrabri Shire Council has indicated a number of residential developments have been proposed which would ease this shortage of rental property in the medium and long term. Narrabri and Narrabri Shire are also considered to have sufficient existing facilities and services to cater for the possible population growth. In any event, the Proponent through its associated companies, has proven itself to be a significant contributor to the communities in which it has operated other mines, eg. Gunnedah, Boggabri and Werris Creek.

The project would also have significant economic benefits to NSW and Australia through the payment of coal royalties, taxes and further establishment of export markets for Australian (and in particular, Gunnedah Basin) coal.

6.3.4 Consequences of not Proceeding with the Project

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

(i) The recoverable coal would not be mined by the Proponent. Such an outcome would be contrary to the DPI (MR) and the Proponent's objective to maximise resource utilisation.

(ii) The opportunity to create up to 113 full-time jobs would be foregone.

(iii) The disposable wages for the full-time and part-time workforce would be foregone, a substantial proportion of which would be spent in the Narrabri/Boggabri/Gunnedah areas.

(iv) The opportunity to diversify industry within the Narrabri Shire would be foregone along with the training opportunities proposed by the Proponent. This loss of training opportunities would also reduce the ability of the local communities to retain younger people who are generally leaving to pursue greater opportunities elsewhere.

(v) Foregoing PAYE taxes for the 35 year to 60 year life of the mine.

(vi) Foregoing coal royalties and payments to State Authorities as well as export earnings which would help offset, at least in part, Australia's foreign debt.

(vii) The minor impacts on the local biophysical environment would not eventuate.

It is considered that the benefits of proceeding with the project therefore far outweigh the minor impacts on the environment that would result. The consequences of not proceeding with the project also weigh heavily in favour of proceeding with the Narrabri Coal Project.

6.4 CONCLUSION

The Narrabri Coal Project has, to the extent feasible, been designed to address the issues of concern to the community and all levels of government. The project provides for the mining, production, sale and despatch of a high quality coal product which would be significant in generating employment opportunities and boosting the local economies of Narrabri and other surrounding communities. The development and operation of the project would be a noticeable change to the economic base of Narrabri Shire which to date has experienced few economic benefits from the coal industry. The post-mining landform would integrate the re-establishment of agricultural land with areas designated for the conservation and extension of native vegetation and fauna habitat.

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

(i) contribute towards satisfying the demand for export quality coal;

(ii) reduce risk levels associated with possible incidents and impacts on the environment to an acceptable level;

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

(iv) satisfy sustainable development principles;

(v) provide for continuing and future use of the Project Site for agriculture;

(vi) provide significant training and employment opportunities for residents of Narrabri and surrounding communities;

(vii) contribute to the diversification of industry within the Narrabri Shire and promote a continued growth in economic activity in the Narrabri and Gunnedah Shires; and

(viii) address the perceived social impacts.