Section 3

Consultation, Issue Identification and Prioritisation

PREAMBLE

This section describes how the environmental issues assessed in the Environmental Assessment were identified and prioritised. In summary:

(i) a comprehensive list of all relevant environmental issues was assembled through consultation with the local community and local and State government agencies and a review of relevant legislation, planning documents and environmental guidelines;

(ii) a review of the Project design and local environment was undertaken to identify risk sources and potential environmental impacts for each environmental issue;

(iii) an analysis of unmitigated risk for each potential environmental impact was then completed with a risk rating assigned to each impact based on likelihood and consequence of occurrence; and

(iv) through a review of the allocated risk ratings and the frequency with which each issue was identified, the relative priority of each issue was determined, with this priority used to provide an order of assessment and breadth of coverage within Section 4.

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3.1 INTRODUCTION

In order to undertake a comprehensive assessment of the Project, appropriate emphasis needs to be placed on those issues likely to be of greatest significance to the local environment, neighbouring landowners and the wider community. To ensure this has occurred, a program of community and government consultation and a review of preliminary environmental studies, planning and other environmental documentation was undertaken to identify relevant environmental issues and potential impacts. This was followed by an analysis of the risk posed by each potential impact in order to prioritise the assessment of the identified environmental issues within this *Environmental Assessment*. Reference should be made to Section 6 where the environmental risks are re-evaluated with the adoption of the mitigation measures proposed by the Proponent.

3.2 ISSUE IDENTIFICATION

3.2.1 Introduction

Identification of environmental issues relevant to the development and operation of the Project involved a combination of consultation and background investigations and research. This included:

- consultation with surrounding land owners and communities (Section 3.2.2.1);
- consultation with State and local government agencies (Section 3.2.2.2); and
- reference to relevant NSW government planning instruments, policies and guidelines, and other strategic planning or environmental documentation (Section 3.2.3).

3.2.2 Consultation

3.2.2.1 Community Consultation

Introduction

The Proponent has maintained an open and honest relationship with the community surrounding the Project Site through a range of formal and informal discussions held with individual community members and groups. Community consultation associated with the Project comprised the following components.

- Informal discussions initially between the Project Manager, Mr Greg Cozens, and individual land owners and residents of Majors Creek village and surrounding areas. During preparation of this document, the Proponent engaged Marcom Communication to undertake further discussions with individuals and groups in relation to the Project.
- A formal bore and residence census completed by the Project Manager to confirm the location of all residences surrounding the Project Site and identify those community members reliant on water obtained from bores.
- Formal community information and feedback forums held in Majors Creek and Araluen.

An information telephone line was established as an avenue for all to ask questions or register compliments and complaints. The results of each of this consultation is below.

Informal Discussions

As indicated in Section 1.4.3, the Proponent and its predecessors have undertaken detailed exploration operations within and surrounding the Project Site since 2002. During that time, the Proponent has rented a house in Majors Creek and has based personnel in the village. In addition, the Proponent and its predecessors has employed a local residents to assist with the exploration operations. Finally, at times, employees of the Proponent have been involved in various sporting and other social aspects within the Majors Creek community. As a result, the Proponent and its employees have been intimately involved with the Majors Creek community since 2002. That has resulted in an informal flow of information in relation to the Project from the Proponent to the community and visa versa.

In addition to the above, the Proponent engaged Marcom Communication in May 2010 to undertake further consultation. A consolidated list of those issues and where each is addressed are presented in **Table 3.1.**

Formal Residence / Bore Surveys

The Project Manager undertook a formal survey to determine the location of all residences in Majors Creek and other areas surrounding the Project Site in June 2010. This was achieved through interpretation of aerial photographs and satellite images and recording of the location of residences using a GPS. The results of that survey were used to ensure that all residences potentially impacted by the Project could be identified. The results of that survey are presented in Section 4.1.5.

In addition, the Project Manager also sought to identify all bores and wells in the vicinity of the Project Site, including those that may not be registered on the databases managed by the NSW Office of Water. This information was collected to ensure that all potentially impacted groundwater users could be identified. The results of that survey are presented in the Groundwater Assessment presented as Part 3 of the *Specialist Consultant Studies Compendium* and Section 4.4.

The assistance of the Majors Creek community in gathering this information is gratefully acknowledged.

Community Information and Feedback Forums

On 11 November 2008, following the development of an initial concept plan for the Project, the Proponent hosted a community meeting in Majors Creek to discuss the proposed development and identify the primary concerns of the community. The meeting was attended by approximately 50 community members who identified that the community had concerns over the development as an open cut mine, the use of cyanide on the site and potential impacts on local water supplies. The Proponent subsequently reviewed the Project design and has excluded open cut mining and cyanide use.

On 12 December 2009, the Proponent hosted a community meeting in Majors Creek to continue discussions with the community. The meeting was attended by approximately 80 community members. The meeting started with a presentation from the Proponent, outlining the scope of work and indicating that the formal approvals process had commenced with the NSW Government. The Proponent then opened the floor for questions, which are captured in **Table 3.1**.

On 19 March 2010, the Proponent met with members of the Majors Creek Community Liaison Committee (MCCLC) in Majors Creek to discuss the status of the Project and answer any questions the MCCLC had on the proposed operations. The meeting was attended by 5 members of the MCCLC. During the session, Mr Peter van der Borgh, Managing Director of Cortona Resources Limited, gave an overview of the Project as it was then understood. Following the presentation, an opportunity was provided to ask questions and provide comments. The MCCLC chose to canvas the local community and submit a community survey that identified the priority issues of concern to the local community at that time. A consolidated list of those issues and where each is addressed are presented in **Table 3.1.**The Proponent provided a written response to the MCCLC following the meeting, summarising the proposed operations and providing a preliminary response to the issues included in the community survey (noting more complete assessment was to be included in the *Environmental Assessment*).

On 22 April 2010, Mr Peter van der Borgh and Mr Alex Irwin (Senior Environmental Consultant of R.W. Corkery & Co. Pty Limited) again met with members of the MCCLC in Majors Creek to discuss the issues raised in the community survey, the Proponent's response to these and the status of project planning and assessment. As following the previous meeting with the MCCLC, a written summary of questions and issues of concern was forwarded to the Proponent by the MCCLC following the meeting and the Proponent has subsequently prepared a written response which will be provided to the MCCLC in July 2010. **Table 3.1** includes those issues raised at the April 2010 MCCLC meeting and the subsequently forwarded documentation, along with the section in the Environmental Assessment where each issue is addressed**.**

Also on 22 April 2010, Mr van der Borgh and Mr Irwin attended a meeting in Araluen to provide this local community with information on the Project, and identify the primary issues of concern to the Araluen community. Approximately 30 people attended the meeting which ran from 7:30pm to 9.30pm. A presentation providing an overview of the Project, assessment completed to date and the planning process to be followed by the Proponent was given by Mr van den Borgh before the floor was opened to the attendees to provide feedback, raise concerns and ask questions. The primary issue of concern to the Araluen community was the potential for the Project to impact on local water supplies and several groundwater studies completed locally were provided to the Proponent for consideration in preparation of the *Environmental Assessment*. A consolidated list of those issues and where each is addressed are presented in **Table 3.1.**

Finally, during the final stages of preparation of this document, a community information session was held in Majors Creek on 13 and 14 August 2010. During that session, a series of posters were presented describing the Project and the anticipated Project-related impacts and representatives of the Proponent and RWC were available to provide information on the Project, together with the anticipated Project-related impacts on a one-to-one basis. In addition, a series of meetings were held with individual residents who may be adversely impacted by the Project and others who requested individual meetings.

A consolidated list of issues rose during the community consultation and where each is addressed is presented in **Table 3.1.**

Table 3.1
Issues raised by Community

Issue raised	EA Section
Issues raised directly with the Proponent	
Water supply, usage and impacts on local water supplies – Majors Creek	4.4.5.8
Water supply, usage and impacts on local water supplies – Araluen	4.4.5.9
Hours of Operation	2.11.2
Local employment opportunities, including provision for training	2.12
Noise impacts and management	4.2
Positioning of infrastructure, including mine portal	2.9.3 and 4.9
Road infrastructure and traffic	4.9
Dust control	4.10
Proposed community contributions	2.12
Ground contamination by chemicals	2.10.2.4
Consultation with community	3.2.2.1
Tailings dam construction and tailings management	2.7
Impact of high use of electricity	4.10.7.2
Rehabilitation	2.14
Impact of the Project on property values	4.13.4
Damage to property from mining activities	4.2.6.5
Impact on wildlife	4.3
Impact on Village lifestyle	4.13.4
Issues raised with Department of Planning	
Soil and Water	
The three aquifer systems and the long term bore monitoring of these by NSW Department of Water be reviewed in light of the rural industries and domestic users currently and potentially in the Valley. This to include possible impacts of upstream interruption to the ground water, surface water and suggested drainage of upstream ground water aquifers;	4.4.5
The water quality and quantity impact to include consideration of the Araluen Valley water rights and the water sharing proposals in the pipeline, (see NSW Dept Water)	4.4.5.9and 4.5
The assessment to include due regard to the CSRIO climate change predictions and to include consideration of possible no pumping indicators.	4.4 and 4.5
Traffic	
Assessment to include consideration of the Araluen Road (a minor/secondary road with little base and no white lines) in the ongoing traffic impact of trucks which will likely destroy the edges, reduce the safety of passing and generally deliver an impact on the standard of this rural country road,	4.9
The assessment to include active safety mitigation strategies to be implemented by the Company in view of the truck movements and the rural nature of the route.	4.9
Socioeconomic	
The Valley has niche market stone fruit orchards with are the backbone of the rural enterprises along with cattle production. Review of the impact of any disturbance to water quantity and quality on the maintenance of the population, maintenance of employment and small businesses:	4.4, 4.5 and 4.13
Review of risks to the accommodation businesses, permanent and seasonal labour for orchards and cattle if these business are adversely effected by water interruptions related to the mine activity.	4.4, 4.5 and 4.13
Review any possible negative impacts on the continued viability of this Valley and the quiet enjoyment of this Valley by residents and visitors alike.	4.13

Calls to the Community Information Line

A Community Information Line (0415 682 917) was established in May 2010 to provide residents with another avenue for consultation. This information line is available 24 hours a day, 7 days a week and is monitored by Marcom Communication. At the time of compiling this document, the information line had received two calls from Majors Creek residents. Both callers wanted to ensure their concerns were captured. The concerns raised on these call have been captured in **Table 3.1**.

Community Submission to Department of Planning

Following initial consultation with the community and further community meetings with the MCCLC, the Department of Planning received a request from the community to amend the DGRs for the Project. The Department determined that the matters raised were already covered by the existing DGRs. However, in light of the community's interest, the issues raised and where each are addressed in this document are presented in **Table 3.1**.

3.2.2.2 Consultation with Government Agencies

A Conceptual Project Development Plan meetings was held with representatives of I&I NSW in Sydney on 13 December 2009. Following that meeting, approval to commence formal consultation with other government agencies was received.

A Planning Focus Meeting was held in Braidwood on 18 March 2010. During that meeting an overview of the Project, as it was then understood, was presented and all attendees inspected the Project Site. Following the site inspection, the government agencies present provided their requirements verbally. Following the meeting, written recommendations were provided to the Department of Planning for incorporation into the Director-General's Requirements (DGRs) for the Project. The DGRs were provided to the Proponent on 23 April 2010. A full copy of the DGRs, along with a tabulated summary of all government agency requirements is presented as **Appendix 2**.

The following government agencies and organisations were consulted by the Proponent and/or its specialist consultants.

- Department of Planning (DoP)*.
- Department of Environment, Climate Change and Water (DECCW)*.
- NSW Office of Water (NOW)*.
- Palerang Council (Council)*.
- Industry and Investment NSW (I&I NSW)*.
- NSW Roads and Traffic Authority (RTA).
- Sydney Catchment Authority (SCA).

Representatives of those government agencies identified with an asterisk (*) attended a Planning Focus Meeting.

Table 3.2 presents a summary of the issues raised in the DGRs and the frequency with which particular environmental issues were identified by the government agencies consulted.

Table 3.2
Government Agency Issue Identification

Government Agency	Issue[1]													
	Air Quality	Greenhouse Gas Emissions	Noise and Vibration	Flora/Fauna	Groundwater Resources	Surface Water Resources (including ESCP)	Aboriginal Heritage	Rehabilitation & Final Land Use	Waste Management	Land Contamination	Soils and Land Capability	Traffic Impacts	Socio-economic Impacts	Infrastructure Requirements and Justification
DECCW	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			✓
NOW					✓	✓								
I&I NSW				✓				✓						
Council			✓	✓	✓	✓	✓		✓			✓	✓	✓
RTA												✓	✓	
SCA					✓	✓								

Subsequent to the Planning Focus Meeting, the Proponent, or their representatives consulted with a number of government agencies or authorities. A summary of the consultation is provided as follows.

Department of Environment, Climate Change and Water

A meeting was held on site on 7 May 2010 with representatives of the DECCW to discuss the results of the Ecology Assessment and the proposed Biodiversity Offset Strategy. The meeting was attended by Dr Sandie Jones and Ms Erin Papps of the DECCW, Mr Garry Daly of Gaia Research (ecological consultant), Mr Greg Cozens of Cortona Resources Limited and Mr Mitchell Bland of RWC. The outcomes of the meeting were as follows.

- Further assessment of the grassland and pasture areas was required to determine whether sections of those areas may be classified as Native Grasslands.
- It would not be appropriate as part of the Biodiversity Strategy to return areas of grassland to forest. In addition, appropriately managed grazing would not be contrary to the management objectives of any proposed biodiversity strategy for the pasture/grassland areas of the Project Site. As a result, the Proponent was to prepare a Biodiversity Strategy that identifies the ongoing agricultural operation of the northern section of the Project Site for biodiversity purposes, Indicatively it was agreed that this could be achieved through development and approval of a *Property Vegetation Plan* prepared under the *Native Vegetation Act 2003*. DECCW would determine the adequacy of the Biodiversity Strategy during its review of the Project.

NSW Office of Water

Following the Planning Focus Meeting, which a NSW Office of Water (NOW) representative was unable to attend, a number of telephone conversations and follow-up emails were held between:

- Mr Wayne Ryan of NOW;

- Mr Darryl Goldrick and Mr Andrew Macleod of SEEC (surface water consultant);
- Mr Errol Briese of Australasian Groundwater and Environmental Consultants (groundwater consultant); and
- Mr Mitchell Bland of RWC.

Those discussions and subsequent emails concluded the following.

- The Proponent's harvestable right, based on a landholding of 396ha, is 34.5 ML and that water collected within dams constructed under that right can be used for any purpose, including mining-related purposes.
- Surface water and groundwater in the Moruya Catchment associated with alluvial aquifers adjacent to 3rd order or higher streams is under an embargo and no further allocations can be granted. Groundwater within fractured hard rock aquifers is not under an embargo and a licence and associated allocation may be issued, pending standard NOW requirements.

Subsequently, a meeting was held with the (NOW) on 16 July 2010 in Sydney to discuss the results of the groundwater and surface water reports and identify the appropriate licensing and/or compensatory flow regime that should apply to the Project. That meeting was attended by the following.

- Mr Fergus Hancock and Mr Greg Russell of NOW.
- Mr Errol Breise of AGE.
- Mr Andrew Macleod of SEEC.
- Mr Ajanth Saverimutto of Cortona Resources Limited.
- Mr Mitchell Bland.

At that meeting, the following was determined.

- The groundwater assessment is to determine the potential impact of the escarpment at the head of the Araluen Valley on the groundwater model and assessment results.
- The groundwater assessment should present an annual picture of groundwater impacts as mining operations commence and develop, as well as during recovery of the groundwater system following completion of mining operations.
- The Proponent could consider including compensatory flows to compensate for the anticipated Project-related impacts to base flows in creeks surrounding the Project Site. However, those compensatory flows should only seek to compensate for impacts that are measurable and meaningful. NOW will assess the adequacy of the proposed compensatory flow program during its review of the Project.

Sydney Catchment Authority

Initial consultation was undertaken with the Sydney Catchment Authority (SCA) in March 2010. During that consultation it was identified that the Project would not result in any surface disturbance within the Shoalhaven Catchment. Based on that information, the SCA indicated that they had no interest in the Project.

Following receipt of the preliminary results of the Groundwater Assessment it was recognised that the Project would result in lowering of groundwater levels within the Shoalhaven Catchment. As a result, Mr Mitchell Bland of RWC contacted Mr Ravi Sundaram of SCA on 19 July 2010 and provided additional information in relation to the Project. Mr James Caddey of the SCA inspected the Project Site on 29 July 2010 and determined the following.

- That the catchment boundaries identified in this document are broadly consistent with the boundaries identified by SCA.
- That the SCA would like to see bores located to the north of the Project Site monitored regularly.
- That any surface disturbance within the Shoalhaven Catchment should include standard sediment and erosion control measures identified in Landcom (2004) and DECCW (2008).

Palerang Council

Representatives of the Proponent met with eight Palerang Councillors (including Mayor Walter Reynolds) and three Council staff at the Palerang Council Chambers on 3 December 2009 to introduce and discuss the proposed development. The Proponent was well received with it noted by Council during the meeting that the Project was the most significant development in the Palerang LGA in 20 years. **Table 3.3** presents a summary of the issues raised and where each is addressed in this document.

A subsequent meeting between the Proponent and Mr Bill Ellison of Palerang Council on 5 may 2010 identified further issues associated with the Project. **Table 3.3** presents a summary of the issues raised and where each is addressed in this document.

3.2.3 Review of Planning Issues and Environmental Guidelines

3.2.3.1 Introduction

A number of State and regional planning instruments apply to the Project. These planning instruments were reviewed to identify any environmental aspects requiring consideration in the *Environmental Assessment*. In addition, the DGRs identified a number of guideline documents to be referenced/reviewed during the preparation of the *Environmental Assessment* (see **Table A2-1**).

A brief summary of each relevant planning instrument is provided in Sections 3.2.3.2 to 3.2.3.4. The application and relevance of planning instruments related to specific environmental issues have been assessed in the relevant specialist consultant assessments. Section 3.2.4.5 briefly outlines the approach taken to referencing and reviewing environmental guideline documents.

Table 3.3
Issues raised by Palerang Council

Issue raised	EA Section
Issues raised during 3 December 2009 Presentation	
Employment: How many employees will the Project require and from where will they be drawn.	2.12
Waste Management: What waste would be generated, how is it to be managed and is there potential for it to be recycled and used for other purposes. Council would like to minimise volume of waste going to Council managed facilities.	2.8
Water: What will be the water demand, from where will water be sourced and what impacts might this have on other water users.	2.10.2, 4.4 and 4.5
Rehabilitation: What security will be in place to ensure that the site is rehabilitated appropriately.	2.14 and 2.15
Emergency Management: How will emergencies on site be managed.	2.13
Hours of Operation: Information on the proposed hours of operation was requested.	2.11.2
Complimentary Land Use(s): Could tourist development be established to compliment the mining operations (establishment of tourist paths in and around the old mine workings).	4.1.5.2
Issues raised during 5 May 2010 Meeting	
The condition of Majors Creek Road is such that maintenance and upgrading works will be required. A memorandum of understanding outlining upfront and ongoing contributions to road maintenance is to be negotiated separately to the application for project approval.	Not applicable
Further details in relation to the Traffic Assessment are required.	4.9
Details in relation to general waste to be included in *Environmental Assessment.*	2.8
Details in relation to proposed community contributions to be included in *Environmental Assessment.*	2.12

3.2.3.2 State Planning Issues

State Environmental Planning Policy (Major Development) 2005

Clause 6 of the *State Environmental Planning Policy (Major Development) 2005* (Major Development SEPP) identifies that development of the kind specified in Schedule 1 of the Major Development SEPP is declared to be a Project. Paragraph 5(1)(b) of Schedule 1 identifies development for the purposes of mining-related works with a capital cost of more than $30 million as development to which the Major Development SEPP applies. The Proponent estimates that the capital cost for the Project would be approximately $42 million. As a result, the Minister declared the Project to be a Major Project for which project approval under Part 3A of the EP&A Act is required on 22 January 2010.

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

The State Environmental Planning Policy (SEPP) (Mining, Petroleum Production and Extractive Industries) 2007 (Mining SEPP) was gazetted on 17 February 2007, in recognition of the importance to New South Wales of mining, petroleum production and extractive industries. The quoted aims of the SEPP are as follows.

"*a. To provide for the proper management and development of mineral, petroleum and extractive material resources for the purpose of promoting the social and economic welfare of the State.*

b. To facilitate the orderly and economic use and development of land containing mineral, petroleum and extractive material resources.

c. To establish appropriate planning controls to encourage ecologically sustainable development through the Environmental Assessment, and sustainable management, of development of mineral, petroleum and extractive material resources."

The Mining SEPP specifies matters requiring consideration in the assessment of any mining-related development. **Table 3.4** presents an overview of the matters that a consent authority needs to consider and where each is addressed in the *Environmental Assessment.*

State Environmental Planning Policy (Infrastructure) 2007

The *State Environmental Planning Policy (Infrastructure) 2007* (Infrastructure SEPP) identifies, amongst other things, the matters to be considered in the assessment of development adjacent to particular types of infrastructure.

Clause 45 of the Infrastructure SEPP identifies that where development would be carried out within or immediately adjacent to an easement for electricity purposes, the determining authority must give written notice to the electricity supply, inviting comments about potential safety risks and take into consideration any response received. The Proponent notes that the Project would require the connection of an electricity transmission line. As a result, the determining authority would be required to consult with Country Energy in relation to the Project.

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

Hazardous and offensive industries, and potentially hazardous and offensive industries, relate to industries that, without the implementation of appropriate impact minimisation measures would, or potentially would, pose a significant risk in relation to the locality, to human health, life or property, or to the biophysical environment.

In accordance with SEPP 33 the hazardous substances and dangerous goods to be held or used on the Project Site are required to be identified and classified in accordance with the risk screening method contained within the document entitled "Applying SEPP 33 Consultation Draft July 2008", (DoP, 2008). Hazardous materials are defined within DoP (2008) as substances falling within the classification of the Australian Code for Transportation of Dangerous Goods by Road and Rail (Dangerous Goods Code).

The Project would involve the storage of approximately 50 000L of diesel fuel, Class 3 C1 combustible liquid, and small amounts of other hydrocarbons including lubricating oils and grease, Class 3 C2 combustible liquids. In addition, the Project would also involve storage of the following maximum amounts of explosives within the proposed magazine area (**Figure 2.1**).

- 10t of Ammonium Nitrate and Fuel Oil (ANFO) (Class 1.5D).
- 1t of High Explosives (HE), such as boosters and detonators (Class 1.1D).

As a result, the Project will not require a Preliminary Hazard Assessment under SEPP 33 to be completed.

Table 3.4
Application of the Mining SEPP

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;	4.1.5.2
	- the potential impact on the preferred land uses (as considered by the consent authority) in the vicinity of the development; and	4.2 to 4.13
	- any ways in which the development may be incompatible with any of those existing, approved or preferred land uses.	4.2 to 4.13
	The respective public benefits of the development and the existing, approved or preferred land uses are evaluated and compared.	2.12 and 4.13
	Measures proposed to avoid or minimise any incompatibility are considered.	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.	NR
	Measures taken by the applicant to avoid or minimise any incompatibility are considered.	NR
	The public benefits of the development and any existing or approved mining, petroleum production or extractive industry must be evaluated and compared.	NR
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;	4.4 and 4.5
	- impacts on threatened species and biodiversity are avoided or minimised; and	4.3
	- greenhouse gas emissions are minimised and an assessment of the greenhouse gas emissions (including downstream emissions) of the development is provided.	4.10.7.2
15: Resource recovery	The efficiency of resource recovery, including the reuse or recycling of material and minimisation of the creation of waste, is considered.	2.4 and 2.8
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.	2.9 and 4.9
	- Limitation of the number of truck movements that occur on roads within residential areas or roads near to schools.	
	- The preparation of a code of conduct for the transport of materials on public roads.	4.9
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;	2.14
	- the appropriate management of development generated waste;	2.8
	- remediation of any soil contaminated by the development; and	NR
	- 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.	2.14

Note 1: This is a matter for the Department of Planning to determine NR = Not relevant.

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

The former Tallaganda Local Government Area is identified in Schedule 1 of SEPP 44 as an area that could provide habitat for Koalas. As required by the SEPP, an investigation to determine if the Project Site represents core or potential Koala habitat will be presented in the *Environmental Assessment*.

SEPP 44 has been addressed by the ecological consultant to the Project. The resulting report is presented as Part 4 of the *Specialist Consultant Studies Compendium* and is summarised in Section 4.3.

3.2.3.3 Regional Planning Issues

Drinking Water Catchments Regional Environmental Plan No 1

Clause 6 of the *Drinking Water Catchments Regional Environmental Plan No 1* (Drinking Water Catchments REP) identifies the upper Shoalhaven River catchment as part of the land covered by this plan. The northern-most section of the Project Site extends into this catchment; however, no surface disturbing activities would be undertaken within the upper Shoalhaven Catchment. It is, however, noted that the Groundwater Assessment determined that dewatering of the proposed Dargues Reef Mine would result in drawdown of groundwater levels and the completion of mining operations that would extend into the Shoalhaven Catchment (see Section 4.4.5.3). Numerical modelling indicated that this drawdown would result in reduced groundwater discharge in the Shoalhaven Catchment of up to approximately 0.4L/s (see Section 4.4.5.6).

Table 3.5 presents an overview of the matters that a consent authority needs to consider and where each is addressed in the *Environmental Assessment.*

Table 3.5
Application of the Drinking Water Catchments REP

Page 1 of 2

Relevant SEPP Clause	Description	EA Section[1]
25 Recommended practices and performance standards of the Sydney Catchment Authority	(1) Any development or activity proposed to be carried out on land to which this plan applies should incorporate any current recommended practices and performance standards endorsed or published by the Sydney Catchment Authority that relate to the protection of water quality.	NR
	(2) If any development or activity does not incorporate the Authority's current recommended practices and standards, the development or activity should demonstrate to the satisfaction of the consent authority or determining authority how the practices and performance standards proposed to be adopted will achieve outcomes not less than the Authority's current recommended practices and standards.	NR
	(3) A copy of each of the Authority's current recommended practices and standards must be available for public inspection at the office of the Authority without cost during ordinary office hours and on the Authority's website.	SCA

Table 3.5 (Cont'd)
Application of the Drinking Water Catchments REP

Relevant SEPP Clause	Description	EA Section[1]
26 Development consent cannot be granted unless neutral or beneficial effect on water quality	A consent authority must not grant consent to the carrying out of development under Part 4 of the Act on land in the hydrological catchment unless:	
	(a) it has considered whether the proposed development will have a neutral or beneficial effect on water quality, and	4.5.6
	(b) it is satisfied that the carrying out of the proposed development would have a neutral or beneficial effect on water quality.	4.5.6
28 Development that needs concurrence of Chief Executive	(1) A person must not carry out development on land in the hydrological catchment except with the concurrence of the Chief Executive (except as provided by subclause (3)).	NR
	(2) For the purposes of section 30 (3) of the Act, the matters that are to be taken into consideration by the Chief Executive in deciding whether to grant concurrence are:	
	(a) whether the development incorporates any current recommended practices and performance standards endorsed or published by the Sydney Catchment Authority that relate to the protection of water quality, and	NR
	(b) if the development does not incorporate those practices and standards, whether the alternative practices that relate to the protection of water quality that have been adopted in relation to the development will achieve at least the same outcomes as those practices and standards, and	NR
	(c) whether the development will have a neutral or beneficial effect on water quality.	4.5.6
	(3) This clause does not apply if the consent authority is satisfied that the proposed development:	
	(a) has no identifiable potential impact on water quality, or	4.5.6
	(b) will contain any such impact on the site of the development and prevent it from reaching any watercourse, waterbody or drainage depression on the site, or	4.5.6
	(c) will transfer any such impact outside the site by treatment in a facility and disposal approved by the consent authority (but only if the consent authority is satisfied that water quality after treatment will be of the required standard).	NR
	(4) For the purposes of subclause (3), site means the site of the proposed development.	NR
	(5) A consent authority must forward a copy of its determination of a development application which required the concurrence of the Chief Executive to the Chief Executive within 10 days after the determination is made.	DoP
	(6) This clause does not apply to where the Minister is the consent authority.	NR
29 Development that needs to be notified to Chief Executive	(1) A consent authority must, at the end of March, June, September and December each year, provide details to the Chief Executive of all development applications relating to land within the hydrological catchment determined by it within the preceding 3 months.	DoP
	(2) A determining authority must, at the end of March, June, September and December each year, provide details to the Chief Executive of all applications for approval relating to land within the hydrological catchment determined by it within the preceding 3 months.	DoP

Note 1: NR = Not relevant, DoP = matter for consideration by the Department of Planning, SCA = matter for consideration by the Sydney Catchment Authority

3.2.3.4 Local Planning Issues

Tallaganda Local Environment Plan 1991 (Tallaganda LEP)

The Project Site occurs within the Palerang Local Government Area and permissibility of development is governed by the *Tallaganda Local Environment Plan 1991* ("Tallaganda LEP"). Under that Plan, the Project Site is zoned Zone 1(a). **Figure 1.3** presents the land zoning within and surrounding the Project Site.

Clause 9 of the Tallaganda LEP identifies that the objectives of Zone 1(a) (General Rural) are:

> *to promote the proper management and utilisation of resources by:*
>
> *(a) protecting, enhancing and conserving:*
>
> *(i) agricultural land, particularly prime crop and pasture land, in a manner which sustains its efficient and effective agricultural production potential,*
>
> *(ii) soil stability by controlling and locating development in accordance with soil capability, as identified by the Soil Conservation Service,*
>
> *(iii) forests of existing and potential commercial value for timber production,*
>
> *(iv) valuable deposits of minerals, coal, petroleum and extractive materials by controlling the location of development for other purposes in order to ensure the efficient extraction of those deposits,*
>
> *(v) trees and other vegetation on environmentally sensitive land and in any place where the conservation of the vegetation is significant to the protection of scenic amenity or natural wildlife habitat or is likely to control or contribute to the control of land degradation,*
>
> *(vi) water resources and water catchment areas for use in the public interest,*
>
> *(vii) localities of significance for nature conservation, including localities with rare plants, wetlands, permanent watercourses and significant wildlife habitat, and*
>
> *(viii) places and buildings of archaeological or heritage significance, including aboriginal relics and places,*
>
> *(b) facilitating farm adjustments,*
>
> *(c) minimising the cost to the community of:*
>
> *(i) fragmented and isolated development of rural land, and*
>
> *(ii) providing, extending and maintaining public amenities and services, and*
>
> *(d) providing land for future urban development, for rural residential development and for development for other non-agricultural purposes, in accordance with the need for that development, and subject to the capability of the land and its importance in terms of the other provisions of this clause.*

Mining is permissible with consent within this zone.

3.2.3.5 Strategic Planning Documents

Southern Rivers Catchment Action Plan

Developed by the Southern Rivers Catchment Management Authority (CMA), the purpose of the Southern Rivers Catchment Action Plan ("the Plan") (Southern Rivers CMA, undated) is to provide strategic direction for investment in natural resource management for the Southern Rivers catchment. The Plan identifies community, biodiversity, water and land assets and has assigned targets, actions and ways to monitor progress toward improvement.

3.2.3.6 Environmental Guidelines

The DGRs require that in assessing the identified key assessment requirements, reference be made to one or more guideline documents. In addition, a number of the government agencies consulted in relation to the Project required reference to other environment guideline documents. **Table A2.2** of **Appendix 2** identifies each of these guidelines and reference is made as relevant to these in the appropriate section of the *Environmental Assessment* or part of the *Specialist Consultant Studies Compendium*.

3.2.4 Summary of Environmental Issues

Based on the results of the consultation undertaken and a review of relevant planning instruments and environmental guidelines, the following issues of relevance to the Project have been identified.

- Air Quality.
- Blasting/vibration.
- Bushfire.
- Cultural Heritage.
- Ecology (Biodiversity).
- Groundwater.
- Land Contamination.
- Noise.
- Rehabilitation/Final Landform/Land Use.
- Socio-economic Climate.
- Soil and Land Capability.
- Surface Water/Erosion and Sedimentation.
- Traffic.
- Visual Amenity.
- Waste Management.

For each of the environmental issues identified, potential environmental impacts associated with the Project have been identified through consideration of the type of impact, receptor(s) to the impact and potential consequences (see **Table 3.6**). Through consideration of the potential impacts, the relative priority of each environmental issue is considered in Section 3.3.

Table 3.6
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source (s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Groundwater	• Pollution of groundwater due to leaching of contaminants from the TSF.	• Local aquifer(s). • Local groundwater users.	• Decreased groundwater quality.	• Reduced availability of water for beneficial uses, eg. domestic water supply, environmental flows. • Detrimental impacts on biota dependent on local surface or groundwater resources.
	• Pollution of groundwater due to hydrocarbon spills.	• Local aquifer(s). • Local groundwater users.	• Decreased groundwater quality. • Detrimental impact on beneficial uses of groundwater.	• Reduced groundwater quality leading to reduction in beneficial uses of the water and therefore availability to existing groundwater users.
	• Reduction of groundwater levels due to mining and associated drawdown.	• Local aquifer(s). • Groundwater bores of adjoining land owners. • Groundwater dependent ecosystems.	• Reduction in the quantity of water stored in local aquifer(s). • Decrease in availability of groundwater to adjoining land owners and/or groundwater dependent ecosystems.	• Reduction in groundwater levels. • Reduced yields of local groundwater bores. • Adverse impact on or reduced viability of groundwater dependent ecosystems.
	• Dewatering of local hard rock aquifers as a result of blasting induced fracturing.	• Hard (bedrock) aquifer.	• Dewatering of fracture flow sourced groundwater bores.	• Dewatering of local groundwater bores.
	• Reduced volume and/or quality of water recharging surface water flows.	• Local streams, and springs.	• Changes to local hydrological regime and surface flows. • Decreased quality of water within local creeks.	• Reduced surface flows to Spring and other creek catchments of the Araluen River. • Degradation of groundwater dependent ecosystems.
Surface Water/ Flooding/ Erosion and Sedimentation	• Reduction in environmental flows through on-site capture of water.	• Downstream water users. • Local and regional biota.	• Reduced flows to downstream water users. • Reduced flows to downstream biota.	• Reduced availability of water to downstream users. • Structural change to, or degradation of downstream vegetation (including GDE's). • Degradation of aquatic habitats.
	• Discharge of dirty, saline or contaminated water.	• Local creeks and tributaries. • Project Site soils and vegetation.	• Decreased water quality. • Contamination of soil resources.	• Pollution of downstream waters. • Pollution of local waterways resulting in death of flora and fauna. • Contamination of soil resources and indirect impacts on future land use.

Source: Modified after HB203:2006 (Standards Australia, 2006) - Table 3

Table 3.6
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source (s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Surface Water/ Flooding/ Erosion and Sedimentation	• Discharge of contaminated water from the TSF.	• Local and regional catchment ecosystem.	• Introduction of toxic compounds to the environment. • Contamination of soil and water resources.	• Contamination of local waterways. • Contamination of local soils. • Poisoning of native flora and fauna. • Long-term degradation of landform and reduced potential for future beneficial use.
	• Changes to hydrology of creeks and drainage lines.	• Local creeks and drainage lines.	• Reduced flows. • Changed alignment of hydrological flow.	• Reduced surface flows within the affected waterway(s) and the Araluen River catchment. • Increased erosion potential resultant from changed alignment of flow. • Reduction in the quality of aquatic habitat.
	• Changes to local flood regimes.	• Spring Creek and associated communities and ecosystems.	• Changes to frequency or intensity of local flooding.	• Increased erosion potential within local catchments. • Changes to vegetation community structure and habitat value. • Detrimental impacts on surrounding properties as a result of changes to flooding regime.
	• Soil erosion (due to the erosive actions of water).	• Project Site soils.	• Loss of topsoil.	• Erosion of disturbed areas on the Project Site. • Erosion of rehabilitated areas and/or final landform of the Project Site.
	• Sedimentation of water on and discharged from the Project Site.	• Local creeks and drainage features.	• Increased sedimentation within downstream creeks.	• Increased sediment load in drains and/or waterways.
Soil Resources	• Reduction in soil quality and availability through poor management practices.	• Project Site soils.	• Structural damage to soils through poor soil management practices. • Reduced biological activity of soils.	• Insufficient soil quantities for rehabilitation. • Reduced soil quality.
	• Increased erosion or erosion potential of soils.	• See “erosion and sedimentation” above.	• See “erosion and sedimentation” above.	• See “erosion and sedimentation” above.
Biodiversity (Flora and Fauna)	• Removal of native vegetation due to clearing activities.	• Vegetation within Project Site and area of influence.	• Removal of habitat and disturbance to threatened species, populations or communities.	• Loss of, or alteration to, existing habitats. • Direct adverse impact on threatened species, populations and communities.

Source: Modified after HB203:2006 (Standards Australia, 2006) - Table 3

Table 3.6 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Biodiversity (Flora and Fauna) (Cont'd)	• Disturbance to threatened species, populations and endangered ecological communities.	• Threatened species, populations and communities identified, known to occur, or considered as potentially occurring within the Project Site.	• Removal of threatened species, populations and communities from the Project Site. • Reduction in the potential for future immigration of threatened species, populations and communities to the Project Site.	• Local or regional reduction in distribution of threatened species, populations and endangered ecological communities. • Possible local extinction of threatened species, populations and endangered ecological communities.
	• Disturbance to fauna and fauna habitat as a result of ongoing operations, eg. dust etc.	• Local communities and ecosystems.	• Reduced suitability of habitat on and surrounding the Project Site for native fauna.	• Local or regional reduction in distribution of threatened species, populations and endangered ecological communities. • Possible local extinction of threatened species, populations and endangered ecological communities.
	• Pooling of contaminated water on the TSF.	• Local fauna.	• Ingestion of water by local fauna.	• Poisoning of native fauna.
Aboriginal Heritage	• Removal or destruction of known Aboriginal sites and/or artefacts.	• Local archaeological setting.	• Damage or destruction of Aboriginal artefacts or site.	• Destruction of impacted site. • Cumulative reduction of the in-situ archaeological record.
	• Removal or destruction of currently unidentified Aboriginal sites and/or artefacts.			
European Heritage	• Removal or destruction of sites of heritage significance due to project activities.	• Local archaeological setting.	• Loss or damage to heritage sites.	• Loss or destruction of items of heritage significance.
Noise	• Increased noise levels resulting from operation of mobile equipment, crushing and screening equipment and product transportation.	• Surrounding residents, land owners and native fauna.	• Decreased amenity. • Impacts on the health and well-being of local residents. • Decreased land values. • Detrimental effects on local fauna	• Increased noise and levels associated with Project activities causing annoyance, distractions, ie. amenity impacts. • Sleep disturbance as a result of maximum noise levels. • Increased noise levels associated with the Project leading to impacts on local fauna assemblage.

Source: Modified after HB203:2006 (Standards Australia, 2006) - Table 3

Table 3.6 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Vibration	• Increased levels of vibration from mine blasting.	• Structural damage to buildings and structures. • Reduced local amenity. • Reduced production from livestock.	• Surrounding residences, buildings and other structures. • Local livestock.	• Structural damage to buildings and structures. • Nuisance/amenity impacts on surrounding landowners / residents.
	• Fracture induced dewatering of hard rock aquifer(s).	• bedrock aquifer. • Groundwater bores.	• Reduced yield / availability of water from affected groundwater bores.	• Reduced yield / availability of water from affected groundwater bores.
Air Pollution – Dust, Odour, other	• Dust generation resulting from vehicle movements on unsealed roads and wind action on disturbed areas, overburden emplacements and stockpiles.	• Surrounding residences and buildings. • Surrounding native vegetation. • Local residents.	• Increased deposited and suspended particulates. • Health-related complaints.	• Nuisance/amenity impacts from dust deposited on window sills, cars, surfaces etc. • Adverse health impacts (if PM_{10} levels are excessive). • Stress of native vegetation, and indirect impacts on fauna habitat.
	• Greenhouse gas emissions.	• Local and global air-shed	• Increased greenhouse and other gas emissions.	• Increased contribution to greenhouse effect.
Traffic and Transport	• Construction of new entrance to the Project Site.	• Local landforms and road network.	• Impacts associated with road construction (noise, dust, ecology, heritage etc.).	• See "*air pollution*", "*flora and fauna protection*" and "*noise*" and "*Aboriginal heritage*" above. • Temporary inconvenience to commuters if stopped for road works.
	• Increased traffic levels due to movement of workforce and contractors.	• Local road network. • Existing road users.	• Increased vehicle movements (especially heavy vehicles) on local roads.	• Increased traffic congestion. • Elevated risk of accident/incident on local roads. • Road pavement deterioration.
	• Increased heavy vehicle movements for product transportation.			

Source: Modified after HB203:2006 (Standards Australia, 2006) - Table 3

Table 3.6 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Visual Amenity	• Changes in visual characteristics of the Project Site.	• Surrounding residents and local motorists.	• Clearing of native vegetation and increased visibility of the quarry activities.	• Decreased visual amenity.
	• Impacts of night lighting.	• Surrounding residents and local motorists.	• Reduced local amenity. • Distraction to local motorists.	• Decreased visual amenity. • Elevated risk of traffic incident.
Rehabilitation and Final Landform	• Temporary or permanent changes to the landform of the Project Site.	• Project Site land surrounding land owners and/or residents.	• Reduced amenity of the Project Site land and influence on activities/lifestyle of adjoining land owners. • Altered final land use not compatible with activities/lifestyle of adjoining land owners.	• Reduced amenity of the final landform resultant from altered topography. • Final landform and land use that is not compatible with activities/lifestyle of local community.
Waste Management	• Production of contaminating or polluting materials, eg. waste oils, saline water, tailings, general rubbish.	• Project Site land and water resources. • Downstream land and water resources. • Local and regional groundwater.	• Contamination of downstream surface waters. • Contamination of groundwater. • Contamination of downstream lands. • Reduced visual amenity.	• Contamination of surface water. • Contamination of groundwater. • Contamination of soil resources by leaking or spilt residue. • Reduced amenity of Project Site due to poor rubbish, litter management.
	• Acid Mine Drainage from mineralised waste rock.	• Project Site land and water resources. • Downstream land and water resources. • Local and regional groundwater.	• Contamination of downstream surface waters. • Contamination of groundwater. • Contamination of downstream lands.	• Contamination of local water and/or soil resources by leaking or spilt residue.

Table 3.6 (Cont'd)
Risk Sources and Potential Environmental Impacts

Environmental Issue	Risk Source/potential incident(s)	Receptor/Surrounding Environment	Potential Consequences	Potential Environmental Impacts
Waste Management (Cont'd)	• Management of rubbish.	• Project Site and surrounding landholdings.	• Pollution of local lands and waterways with mine rubbish.	• Reduced visual amenity. • Adverse impacts on local waterways and aquatic habitats.
Land Contamination	• Exposure of previously contaminated materials.	• Areas receiving contaminated material (including surface waters).	• Transfer of contaminated materials to non-contaminated areas.	• Contamination of soil resources. • Contamination of surface water.
Bushfire	• Initiation of fire on the Project Site and spread to adjoining properties.	• Project Site personnel and equipment. • Project Site and adjoining land.	• Health and safety impacts to project personnel. • Damage to Project Site equipment. • Damage to adjoining properties and/or native vegetation.	• Injury or health impacts on project personnel. • Operational constraint posed by damaged equipment. • Destruction/damage of native vegetation and fauna habitat.
Socio-Economic Impacts	• Alteration of social activities or employment due to employment generation and capital expenditure.	• Local community and businesses. • Local government.	• Reduced unemployment and increased local spending. • Additional population for schools and community services.	• Improved economic activity and related social impacts attributable to reduced unemployment.
	• Reduction in availability of skilled labour for other local industries.	• Local businesses and industries.	• Movement of skilled labour force from other local industries to mine.	• Reduced availability of labour for other businesses and industries.
	• Increased pressure on local infrastructure.	• Communities of Majors Creek and Braidwood.	• Increase in pressure on housing / rental market. • Increase costs associated with infrastructure maintenance.	• Increased cost of housing and rental accommodation locally. • Increased costs of services.
	• Perceived or real impacts on local amenity of neighbouring properties.	• Surrounding property owners.	• Reduced property values. • Reduced amenity value of landholdings.	• Reduced quality of life (actual or perceived). • Reduced property values.

Source: Modified after HB203:2006 (Standards Australia, 2006) - Table 3

3.3 ANALYSIS OF ENVIRONMENTAL RISK AND ISSUE PRIORITISATION

3.3.1 Introduction

Following the identification of the environmental issues requiring assessment, a review of the Project design, the local environment and other factors was undertaken to identify the sources of environmental risk and their corresponding impacts associated within each issue. This sub-section prioritises the identified environmental issues, with respect to the potential for environmental impact, by the completion of an analysis of risk associated with each environmental issue. The analysis of risk has been completed in accordance with Australian Standards HB 203:2006 and AS/NZS 4360:2004 and through consideration of the likelihood and potential consequence(s) of the environmental impacts.

3.3.2 Analysis of Environmental Risk

Risk is the chance of something happening that will have an impact upon the objectives or the task, which in this case is development and operation of the Project with minimal affect on the local environment. Risk is measured in terms of consequence (severity) and likelihood (probability) of the event happening.

The allocation of a consequence rating is based on the definitions contained in **Table 3.7**. It is noted that the assigned consequence rating represents the highest level applicable, ie. if a potential impact is assigned a level of 4 - Major based on impact to the environment and 2 - Minor based on area of impact, the consequence level assigned would be 4 - Major.

The likelihood or probability of each impact occurring is then rated according to the definitions contained in **Table 3.8**.

The risk associated with each environmental impact is assessed without the inclusion of any operational controls or safeguards in place and is based on the qualitative assessment of consequence and likelihood, a risk ranking of either; low, medium, high or extreme was assigned to each potential impact based on the matrix presented in **Table 3.9**.

The four risk rankings are defined as follows.

Low (L): requiring a basic assessment of proposed controls and residual impacts. Any residual impacts are unlikely to have any major impact on the local environment or stakeholders.

Moderate (M): requiring a medium level assessment of proposed controls and residual impacts. It is unlikely to preclude the development of the Project but may result in impacts deemed unacceptable to some local or government stakeholders.

High (H): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures. Ultimately, this level of risk may preclude the development of the Project.

Table 3.7
Qualitative Consequence Rating

Level	Descriptor	Description
5	Catastrophic	• Massive and permanent detrimental impacts on the environment. • Very large area of impact. • Massive remediation costs. • Reportable to government agencies. • Large fines and prosecution resulting in potential closure of operation. • Severe injuries or death.
4	Major	• Extensive and/or permanent detrimental impacts on the environment. • Large area of impact. • Very large remediation costs. • Reportable to government agencies. • Possible prosecution and fine. • Serious injuries requiring medical treatment.
3	Moderate	• Substantial temporary or minor long term adverse impact to the environment. • Moderately large area of impact. • Moderate remediation costs. • Reportable to government agencies. • Further action may be requested by government agency. • Injuries requiring medical treatment.
2	Minor	• Minor detrimental impact on the environment. • Affects a small area. • Minimal remediation costs. • Reportable to internal management only. • No operational constraints posed. • Minor injuries which would require basic first aid treatment.
1	Insignificant	• Negligible and temporary detrimental impact on the environment. • Affects an isolated area. • No remediation costs. • Reportable to internal management only. • No operational constraints posed. • No injuries or health impacts.
Source: modified after HB 203:2006 (Standards Australia, 2006) - Table 4(B)		

Table 3.8
Qualitative Likelihood Rating

Level	Descriptor	Description
A	Almost Certain	Is expected to occur in most circumstances.
B	Likely	Will probably occur in most circumstances.
C	Possible	Could occur.
D	Unlikely	Could occur but not expected.
E	Rare	Occurs only in exceptional circumstances.
Source: HB 203:2006 (Standards Australia, 2006) - Table 4(A)		

Table 3.9
Risk Rating Matrix

Likelihood	Consequences				
	Insignificant 1	Minor 2	Moderate 3	Major 4	Catastrophic 5
A (Almost Certain)	H	H	E	E	E
B (Likely)	M	H	H	E	E
C (Possible)	L	M	H	E	E
D (Unlikely)	L	L	M	H	E
E (Rare)	L	L	M	H	H
Note: Rating modified after HB 203:2006 (Standards Australia, 2006) - Table 4(C)					

Extreme (E): requiring in-depth assessment and high level documentation of the proposed controls and mitigation measures and possible preparation of a specialised management plan. Unless considered to be adequately managed by the controls and/or management plan, this level of risk is likely to preclude the development of the Project.

Table 3.10 provides an assessment of the unmitigated risk for each potential environmental impact based on the classifications and definitions provided in **Table 3.7** to **Table 3.9** Where appropriate, and to provide a more realistic assessment of the risks posed by the various environmental issues, the environmental impacts have been further defined using either a level, range or scale of impact providing for the various circumstances which may apply. **Table 6.1** in Section 6.2.1 provides an analysis of risk following the implementation of the proposed management and mitigation measures.

Table 3.10

Analysis of Unmitigated Environmental Risk

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Risk Source (see Table 3.6)	Potential Impact (Including Scale if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Groundwater				
Pollution of groundwater due to leaching of contaminants from the TSF	Reduced availability of water for beneficial uses, eg. domestic water supply, environmental flows.	3	C	H
	Detrimental impacts on biota dependent on local surface or groundwater resources.	3	E	M
Pollution of groundwater due to hydrocarbon spills	Contamination requiring minor recovery works.	2	D	M
	Contamination requiring major recovery works.	4	D	H
Reduction of groundwater levels due to mining and associated drawdown	Reduction in groundwater levels.	3	C	H
	Reduced yields of local groundwater bores (Alluvium Aquifer).	4	D	H
	Reduced yields of local groundwater bores (Bedrock Aquifer).	3	C	H
	Adverse impact on or reduced viability of groundwater dependent ecosystems.	3	E	M
Dewatering of bedrock aquifer as a result of blasting induced fracturing	Reduced yields of local groundwater bores (Bedrock Aquifer).	3	D	M
Reduced volume and/or quality of water recharging surface water flows	Reduced surface flows to Spring Creek and other creek catchments of the Araluen River.	3	A	H
	Degradation of groundwater dependent ecosystems.	3	E	M
Surface Water / Flooding / Erosion and Sedimentation				
Reduction in environmental flows	Reduced availability of water to downstream users.	2	B	H
	Structural change to, or degradation of downstream vegetation (including GDE's).	3	D	M
	Degradation of aquatic habitat.	3	D	M

Table 3.10 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source (see Table 3.6)	Potential Impact (Including Scale if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Surface Water / Flooding / Erosion and Sedimentation				
Pollution of downstream waters as a result of discharge of dirty, saline or contaminated water	Isolated and minor discharge of dirty, contaminated or saline water resulting in temporary degradation of water quality in local creeks and tributaries, eg. one-off and discharge of water containing small amount of hydrocarbon contamination.	2	C	M
	Continuing discharge of dirty, contaminated or saline water resulting in ongoing degradation of water quality in local creeks and tributaries, eg. frequent discharge of dirty water.	3	D	M
	Isolated and major discharge of dirty, contaminated or saline water resulting in temporary but wider spread degradation of water quality, eg. major fuel spill discharged to local creek.	4	D	H
Pollution of downstream waters as a result of discharge of dirty, saline or contaminated water	Repeated major event resulting in long-term and wide spread degradation of water quality, eg. repeated or continued discharge of saline water to the downstream catchment.	4	E	H
	Pollution of local waterways resulting in death of flora and fauna.	3	E	M
	Contamination of soil resources and indirect impacts on future land use.	3	E	M
Discharge of contaminated water from the TSF leading to:	Contamination of local soils.	2	D	L
	Contamination of local waterways.	4	E	H
	Poisoning of native flora and fauna.	3	E	H
	Long-term degradation of landform and reduced potential for future beneficial use.	4	E	H
Changes to hydrology of creeks and drainage lines resulting in:	Reduced surface flows within the affected waterway(s) and the Araluen River catchment.	2	B	H
	Increased erosion potential resultant from changed alignment of flow.	2	C	M
	Reduction in the value of aquatic habitat.	3	D	M
Changes to local flood regimes resulting in:	Increased erosion potential within local catchments.	2	C	M
	Changes to vegetation community structure and habitat value.	3	E	M
	Detrimental impacts on surrounding properties as a result of changes to flooding regime.	3	E	M
Soil erosion (due to the erosive actions of water)	Erosion of disturbed areas on the Project Site.	2	C	M
	Erosion of rehabilitated areas and/or final landform of the Project Site.	3	C	H
Increased sediment load in drains and/or waterways	One-off discharge of dirty water from the Project Site.	2	C	M
	Regular discharge of dirty water from the Project Site.	3	D	H

Table 3.10 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source (see Table 3.6)	Potential Impact (Including Scale if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Soil Resources				
Reduction in soil quality and availability.	Insufficient soil quantities for rehabilitation.	2	C	L
	Reduced soil quality.	3	C	M
Increased erosion or erosion potential of soils.		3	C	M
Flora and Fauna (Biodiversity)				
Removal of native vegetation due to clearing activities, leading to:	Loss of, or alteration to, existing habitats.	3	B	H
	Direct adverse impact on threatened species, populations or endangered ecological communities.	2	A	H
Disturbance to threatened species, populations and communities	Local or regional reduction in distribution of threatened species, populations or endangered ecological communities.	4	D	H
	Possible local extinction of threatened species, populations or endangered ecological communities.	4	E	H
Flora and Fauna (Biodiversity)				
Disturbance to fauna and fauna habitat as a result of ongoing operations, eg. dust.	Local or regional reduction in distribution of threatened species, populations or endangered ecological communities.	3	E	M
Pooling of contaminated water on the TSF	Poisoning of native fauna.	2	E	L
Aboriginal Heritage				
Removal or destruction of known (or currently unidentified) Aboriginal sites and/or artefacts	Destruction of impacted site.	4	E	H
	Cumulative reduction of the in-situ archaeological record.	3	C	M
Non-Aboriginal Heritage				
Loss or destruction of items of heritage significance		-	-	-
Noise				
Increased noise levels resulting from operation of mobile equipment, crushing and screening equipment and product transportation.	Occasional minor exceedance of noise criteria (1-2dB(A)).	1	A	H
	Regular minor exceedance of noise criteria (1-2dB(A))	2	A	H
	Occasional marginal exceedance of noise criteria (3-5dB(A)).	3	B	H
	Regular marginal exceedance of noise criteria (3-5dB(A)).	3	B	H
	Occasional major exceedance of noise criteria (>5dB(A)).	4	C	E
	Regular major exceedance of noise criteria (>5dB(A)).	4	D	H
	Maximum noise levels resulting in sleep disturbance.	3	C	H
	Increased noise levels associated with the Project leading to impacts on the native fauna assemblage.	3	E	M

Table 3.10 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source (see Table 3.6)	Potential Impact (Including Scale if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Blasting / Vibration				
Increased levels of vibration from mine blasting resulting in:	Structural damage to buildings and structures.	2	E	L
	Nuisance/amenity impacts on surrounding landowners / residents.	3	D	M
Fracture induced dewatering of bedrock aquifer(s).	Reduced yield / availability of water from affected groundwater bores.	3	E	M
Air Pollution – Dust, Odour, Other				
Dust generation resulting in potential nuisance dust impacts	Deposited dust levels occasionally (for one or two months every year) above DECCW guideline and affecting only adjacent landholders.	2	C	M
	Deposited dust levels regularly (for >5 months per year) above DECCW guideline and affecting landholders some distance from the Project Site.	3	C	H
Air Pollution – Dust, Odour, Other				
Dust generation resulting in potential health impacts	PM_{10} levels occasionally above the Project goal and restricted in distribution.	2	C	M
	PM_{10} levels regularly above the Project goal and affecting landholders some distance from Project Site.	3	C	H
Dust generation resulting in impacts on biota	Deposited dust levels attributable to the Project resulting in stress to adjoining vegetation and reduced quality of fauna habitat.	2	D	L
Greenhouse Gas Emissions	Small increase (<0.05%) in greenhouse gas emissions (compared to 2007 NSW baseline emissions).	1	B	M
	Moderate increase (>0.05%, <0.1%) in greenhouse gas emissions (compared to 2007 NSW baseline emissions).	2	C	M
	Significant increase (>0.1%) in greenhouse gas emissions (compared to 2007 NSW baseline emissions).	3	D	M
Traffic and Transport				
Construction of new entrance to the Project Site	Impacts associated with road construction (noise, dust, ecology, heritage etc.).	See "*air pollution*", "*flora and fauna*", "*noise*" and "*Aboriginal heritage*" above		
	Temporary inconvenience to commuters if stopped for road works.	1	C	L
Increased traffic levels (in particular heavy vehicles) due to movement of workforce and contractors	Increased traffic congestion.	2	D	L
	Road pavement deterioration.	2	C	M
	Elevated risk of accident/incident on local roads	See below		
	– Minor accident - no injury.	1	C	L
	– Minor accident - minor injury.	3	D	M
	– Major accident - moderate injuries requiring hospitalisation.	4	E	H
	– Severe accident - severe injuries or death injury.	5	E	H

Table 3.10 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source (see Table 3.6)	Potential Impact (Including Scale if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Visual Amenity				
Changes in visual characteristics of the Project Site	Temporary disturbance to landform.	1	A	H
	Marginally identifiable change to landscape following rehabilitation and final landform creation.	2	C	M
	Highly identifiable change to landscape following rehabilitation and final landform creation.	3	D	M
	Permanent disturbance to landform.	2	A	H
Impacts of night lighting	Decreased visual amenity.	2	C	M
	Elevated risk of traffic incident.	3	E	M
Rehabilitation / Final Landform / Final Land Use				
Temporary or permanent changes to the landform of the Project Site	Reduced amenity of the final landform resultant from vegetation clearing and altered topography.	2	C	L
	Final landform and land use that is not compatible with activities/lifestyle of local community.	3	C	M
Waste Management				
Production of contaminating or polluting materials, eg. waste oils, saline water, tailings, general rubbish	Contamination of surface water.	3	E	M
	Contamination of groundwater.	3	E	M
	Contamination of soil resources.	2	E	L
Acid Mine Drainage from mineralised waste rock	Contamination of local water and/or soil resources by leaking or spilt residue.	3	E	M
Management of rubbish	Reduced visual amenity.	2	D	L
	Adverse impacts on local waterways and aquatic habitats.	2	E	L
Land Contamination				
Exposure of previously contaminated materials	Contamination of soil resources.	2	E	L
	Contamination of surface water.	2	E	L
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.	2	E	L
	Major damage to Project Site lands and equipment resulting in long-term or complete suspension of operations.	3	E	M
	Impacts on health and safety of project personnel.	3	E	M
Initiation of fire leading to impacts outside the Project Site	Minor disturbance to lands external to the Project Site.	3	E	M
	Major disturbance to lands external to the Project Site.	4	E	H
	Impacts on health and safety of local land owners, residents and the general public.	4	E	H

Table 3.10 (Cont'd)
Analysis of Unmitigated Environmental Risk

Risk Source (see Table 3.6)	Potential Impact (Including Scale if applicable)	Consequence of Occurrence if not Mitigated	Likelihood of Occurrence if not Mitigated	Unmitigated Risk Rating
Socio-Economic Impacts				
Alteration of social activities or employment	Improved economic activity and related social impacts attributable to reduced unemployment.	Net benefit		
Reduction in availability of skilled labour	Reduced availability of labour for other businesses and industries.	2	C	M
Increased pressure on local infrastructure	Increased cost of housing and rental accommodation locally.	3	C	H
	Increased costs of services.	2	C	M
Perceived or real impacts on local amenity of neighbouring properties	Reduced quality of life (actual or perceived).	3	D	M
	Reduced property values.	3	D	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

3.3.3 Environmental Issue Prioritisation

The issues identified as requiring assessment within the *Environmental Assessment* have been prioritised based, in decreasing order, of emphasis upon the following.

1. The key assessment requirements of the DGRs (see Section 3.2.2.2 and **Appendix 2**).
2. Issues with a high frequency of identification (during the consultation program) (see Section 3.2.2).
3. Issues identified with a greater frequency of impacts with high or extreme risk ratings (see **Table 3.10**). **Table 3.11** identifies the number of potential environmental impacts associated with each environmental parameter and the proportion of high and extreme risk impacts and incidents (in decreasing order).

Table 3.11
Environmental Issue Prioritisation

	Potential Impacts	Extreme		High		Combined	
		frequency	%	frequency	%	frequency	%
1. Noise	8	1	13	6	75	**7**	**88**
2. Ecology	7	0	0	6	86	**6**	**86**
3. Heritage	2	0	0	1	50	**1**	**50**
4. Groundwater	11	0	0	6	55	**5**	**55**
5. Surface Water/Erosion and Sedimentation	22	0	0	9	40	**9**	**40**
6. Bushfire	6	0	0	2	33	**2**	**33**
7. Traffic	7	0	0	2	29	**2**	**29**
8. Air Quality	8	0	0	2	25	**2**	**25**
9. Visual Amenity	6	0	0	1	17	**1**	**17**
10. Socio-economic Climate	6	0	0	1	16	**1**	**16**
11. Waste Management	6	0	0	0	0	**0**	**0**
12. Blasting / Vibration	3	0	0	0	0	**0**	**0**
13. Soil and Land Capability	3	0	0	0	0	**0**	**0**
14. Rehabilitation/Final Landform/Land Use	2	0	0	0	0	**0**	**0**
15. Land Contamination	2	0	0	0	0	**0**	**0**

Considering 1 to 3 above, as well as the fact that some environmental issues compliment each other with respect to assessment, the following issue prioritization has been established.

1. Noise
2. Biodiversity
3. Groundwater
4. Surface Water
5. Aboriginal Heritage
6. Non-Aboriginal Heritage
7. Bushfire
8. Traffic
9. Air Quality and Energy
10. Visual Amenity
11. Blasting / Vibration
12. Soil and Land Capability
13. Socio-economic Climate

It is noted that the inclusion of "Socio-economic Setting" at N^{o} 13 is not a direct consequence of the environmental risk analysis. Rather, it is included at N^{o} 13 to enable all other issues to be considered prior to the consideration of the socio-economic setting as this issue invariably is inter-related with many of the preceding issues.