Baal Bone Colliery

Preliminary Environmental Assessment – Ventilation Shaft and Powerline Easement for South Eastern Mining Area, Baal Bone Colliery

February 2007

Umwelt
Environmental Consultants

Preliminary Environmental Assessment – Ventilation Shaft and Powerline Easement, South Eastern Mining Area, Baal Bone Colliery

Prepared by

Umwelt (Australia) Pty Limited

on behalf of

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TABLE OF CONTENTS

FIGURES

APPENDIX

1.0 Introduction

Baal Bone Colliery is located near Cullen Bullen, approximately 25 kilometres northwest of Lithgow (see **Figure 1.1**). The operation extracts coal via longwall mining methods. Baal Bone Colliery proposes to construct a ventilation shaft adjacent to the south eastern main headings. The shaft will provide air for the development and extraction of the southeastern panels (Longwalls 29, 30 and 31). These southeastern reserves were previously deemed inaccessible due to a fault zone (Cox's River Lineament); however recent drilling has found that it is possible to mine through this feature.

The ventilation shaft will require a power supply. It is proposed that this will be in the form of an 11kV power line between the proposed ventilation shaft site and an existing substation, approximately 1.7 kilometres to the northwest.

Following consultation with the Department of Planning (DoP), it has been determined that the proposed development is a major project, in accordance with the State Environmental Planning Policy (Major Projects) (see **Section 3.1**). The preparation of an Environmental Assessment (EA) is therefore required under Part 3A of the *Environmental Planning and Assessment Act 1979* (*EP&A Act*). The consent authority for the project is the Minister for Planning.

This Preliminary Environmental Assessment provides an overview of the project and the relevant environmental issues. The Director-General's requirements for preparation of the EA will be provided by the DoP after consideration of this document and receipt of comments from relevant government agencies.

2.0 Project Description

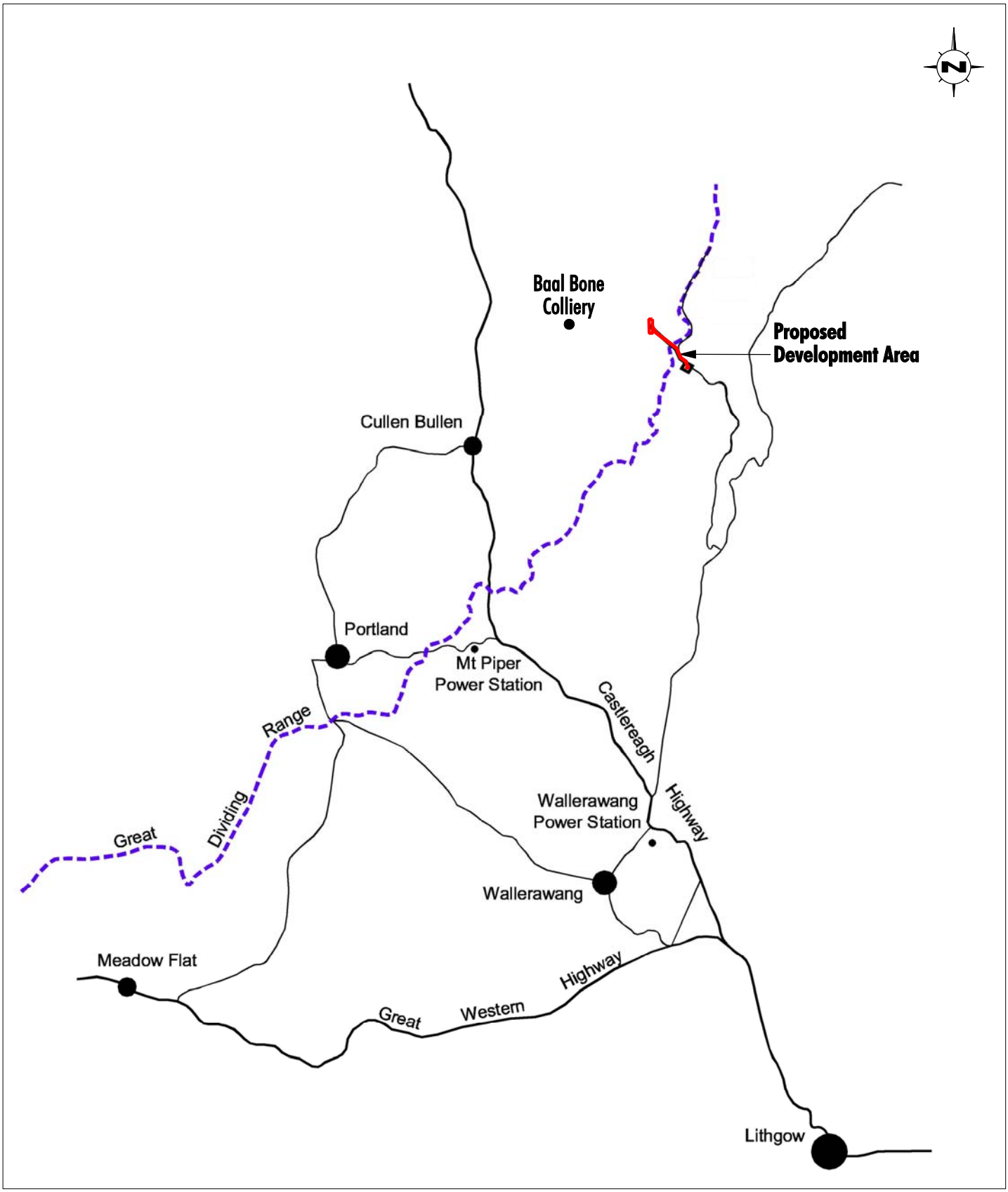
2.1 Existing and Approved Operations

Baal Bone Colliery is operated by Wallerawang Collieries Pty Ltd, a company that is 95% owned by Oakbridge Pty Ltd and 5% owned by Sumitomo Pty Ltd. The major shareholder in Oakbridge Pty Ltd is Xstrata Coal Pty Ltd.

Baal Bone Colliery is one of a number of active mining operations within the Western Coalfields of NSW. Mining commenced in the late 1940s with the Ben Bullen Open Cut Mine being operated by NSW Mining Co Limited (a subsidiary of the State and federal Government owned Joint Coal Board). These operations ceased in the 1950s. The Wallarawang Collieries Limited commenced underground longwall mining at the Baal Bone Colliery in 1982. Open cut mining on the site commenced in February 2005. The Colliery operates under Consolidated Coal Lease (CCL) 749, Mining Leases ML 1302-1389 and Coal Lease 391.

Baal Bone Colliery is a major employer in the Lithgow area, employing a fulltime workforce of approximately 168.

Underground coal mining is carried out in the Lithgow Seam using retreat longwall mining methods. Coal within the longwall panel is removed by a longwall shearer, which travels back and forth across the coal face. The longwall mining machinery cuts a slice of coal from the coal face on each pass. A face conveyor, located across the full length of the coal face, transports the coal away from the face and discharges onto a conveyor belt. A series of conveyors are located in development headings and carry the coal to the surface where it is



Source: Wallerawang Collieries Limited

0 2.5 5 7.5km
1:150 000

FIGURE 1.1

Locality Map

either stockpiled or conveyed directly into the coal preparation plant. Twenty six previous panels have been extracted using this method.

Approximately 2.4 million tonnes of saleable thermal and PCI quality coal is produced annually. Access to Longwalls 29-31 will provide about 5 Mt ROM coal over an anticipated period of two years.

An application for the mining of Longwalls 29-31, under the *Mining Act 1992* in the form of a Subsidence Management Plan, is currently being prepared. If approved, the mining of Longwalls 29-31 will extend the life of the mine from mid 2008 to late 2010.

2.2 Need for the Project

The southeastern reserves (Longwalls 29-31) were previously deemed inaccessible due to the Cox's River faul system; however, recent drilling has found that it is possible to mine through this feature.

The existing underground mine is currently ventilated from fans at the main mine adits; however the current system will not be able to provide sufficient quantities of air to facilitate the development or extraction of Longwalls 29-31.

The proposed ventilation shaft and associated transmission lines will facilitate access to the remaining coal reserves in the area and thus extend the life of the Baal Bone Colliery in the order of two years.

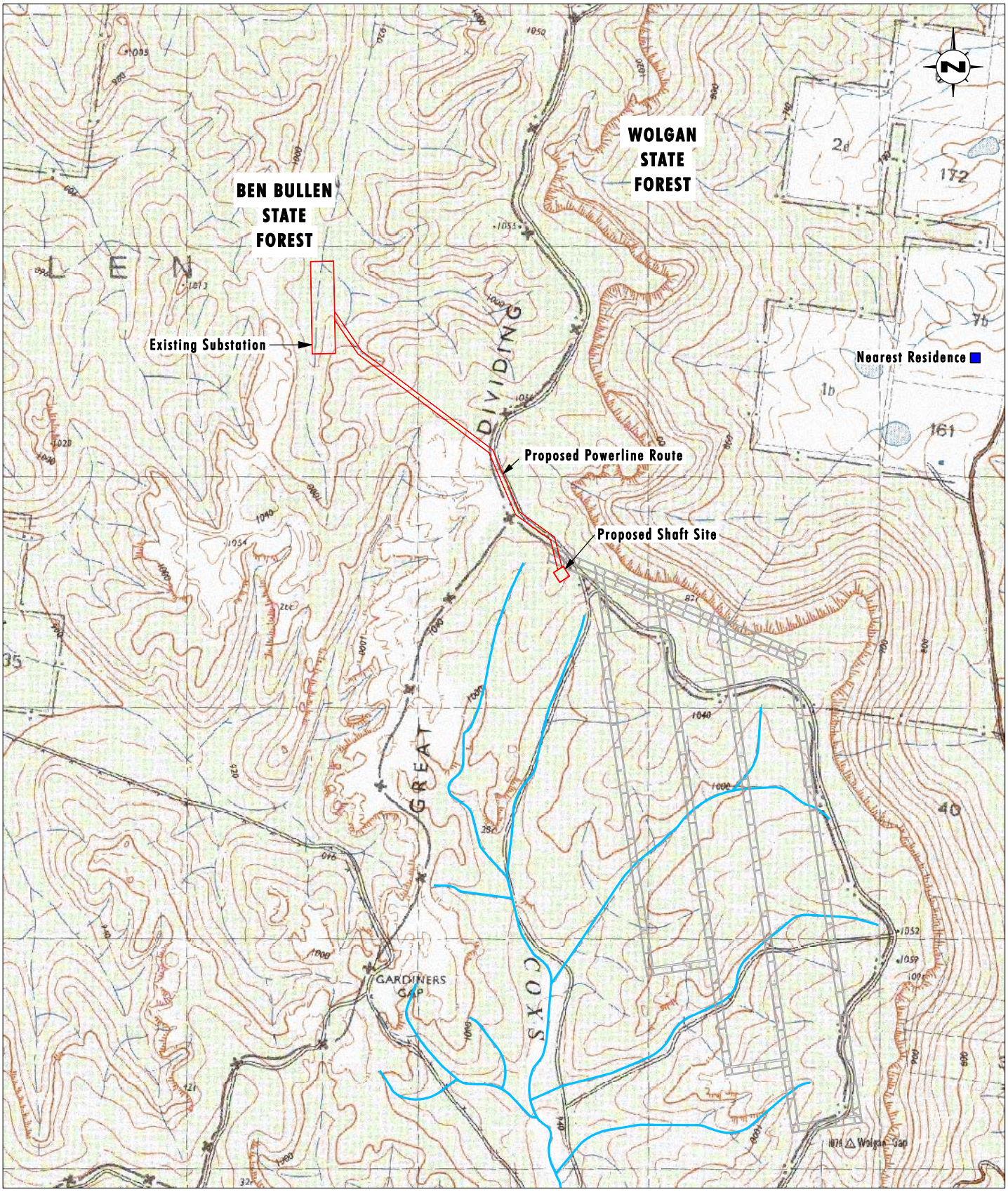
2.3 The Project

The proposed site for the ventilation shaft is located across the boundary of Ben Bullen State Forest and Wolgan State Forest (see **Figure 2.1**).

The shaft will be located within a portion of a 250 x 250 metre area which has been selected because of its close proximity to existing access roads and in order to minimise disturbance. The disturbance area within the site (the shaft site) is expected to be approximately 30 x 30 metres in area. This will provide sufficient area for both the shaft construction and then the subsequent fan installation. The exact positioning of the shaft site is yet to be confirmed.

The shaft will be a maximum of 3.15 metres in diameter and will be constructed using raised bore techniques. This method limits disturbance on the surface because all spoil is left underground and removed into the underground workings. The shaft will be raise bored to a depth of approximately 200 metres to the Lithgow Seam. An exhausting fan will be placed over the shaft with an evasee fitted for noise reduction. This evasee can be installed to expel air in any direction. The fan currently proposed is a 200kW centrifugal fan. Approximate dimensions of the fan and evasee will be 6 x 6 x 4 metres high plus switch gear (approximately 5 x 5 metres).

The surface facilities required during shaft raise boring will include an approximate 50 cubic metre capacity recirculation dam. Approximately 60-100 litres of water per minute will be supplied by water tankers (an estimated 6-8 truck loads per day). Surface facilities required for construction will also include a 750 KVA generator, and a concrete pad for the raise bore machine. This will be approximately 4 x 4 metres in area. The shaft sinking is expected to take in the order of 12 weeks.



Source: LPI, NSW 2000

0 0.25 0.5 1km
1:23 000

Legend

- Proposed Development Area
- Coxs River Headwaters
- Proposed Longwalls (Subject of Separate REF and SMP Process)

FIGURE 2.1

Proposed Development Area

The proposed route of the transmission line is approximately 1.7 kilometres in length and is shown on **Figure 2.1**. In order to minimise overall disturbance, an aerial bundle cable is proposed. This insulated overhead cabling requires limited clearing and pole installation (approximately six poles). Poles can be placed to avoid the need for large scale clearing and only minimal lopping will be required. Some underground (buried) cabling may also be required in some sections, such as where the cable crosses or runs adjacent to an access road. Underground cabling will only be installed in areas where there is existing ground surface disturbance.

The ventilation shaft and transmission line will be in use for approximately two years, the estimated time it will take to extract Longwalls 29-31. The shaft and transmission line will be dismantled once longwall mining has been completed and both areas will be rehabilitated.

3.0 Planning Considerations and Consultation

3.1 Planning Considerations

As noted in **Section 1.1**, the project requires approval under Part 3A of the *EP&A Act* as it is of a class of development listed in Schedule 1 of the State Environmental Planning Policy (Major Projects) 2005.

The proposed ventilation shaft will be constructed within CCL 749; however this lease does not cover the surface of the land. It is therefore not physically on or part of a 'mine' (and current mining lease) and therefore approval under Part 3A will be required because it is 'mining related works'.

In addition to approval required under Part 3A of the EP&A Act, the project may also require approval or assessment under a number of additional Acts or assessment under State Planning Policies. The additional Acts and policies relevant to this project are listed in **Table 3.1**, along with an indication of any approvals likely to be required.

In addition, agreement for the construction of the ventilation shaft and transmission easement on State Forest land will be required from the Department of Primary Industries (DPI) (Forests NSW). The state government is currently exploring the possibility of reserving parts of Ben Bullen and Wolgan State Forests as State Conservation Area (Garden of Stones). The objectives of State Conservation Areas permit the co-existence of underground mining activities.

Table 3.1 - Relevant Legislation and Policies

Planning Provision	Comments	Relevant Licences/Approvals/Assessments
Commonwealth Legislation		
Environment Protection and Biodiversity Conservation Act 1999	The habitat of the Eastern Long-eared Bat (*Nyctophilus timoriensis*), a species listed in the EPBC Act has been recorded within the project area. An assessment under this Act determined that the proposed development would be unlikely to affect any local populations of this species. The development will therefore not need to be assessed as 'controlled action' under the Act (see **Section 4.3.3**).	As the impact of this project on the threatened species is not significant, the approval of the Commonwealth Minister for Environment and Heritage is not required.
NSW Legislation – State Environmental Planning Policies		
State Environmental Planning Policy 11 (Traffic Generating Developments)	SEPP 11 requires that the RTA is made aware of and given the opportunity to make representations in respect of developments listed in Schedule 1 of the SEPP.	As development for the purposes of mining is listed in Schedule 1, the RTA need to be consulted regarding the project. Changes in traffic volumes will only apply to the construction period.
State Environmental Planning Policy 33 (Hazardous and Offensive Development)	SEPP33 requires the consent authority to consider whether an industrial proposal is a potentially hazardous industry or a potentially offensive industry. A hazard assessment is completed for potentially hazardous development to assist the consent authority to determine acceptability.	Baal Bone Colliery's existing operations are not classed as hazardous or offensive and as this project is a component of continuation of mining operations, it is not considered hazardous or offensive. A hazard assessment is therefore considered unnecessary.
State Environmental Planning Policy 44 (Koala Habitat Protection)	SEPP44 restricts granting development consent for proposals on land identified as core koala habitat without the preparation of a plan of management.	A koala habitat assessment was completed as part of the ecological assessment (refer to **Section 4.3.3**). No core koala habitat was found.
State Environmental Planning Policy (Major Projects)	As discussed above, the current project is of a class of development listed in this SEPP.	Assessment under Part 3A of the *EP&A Act*.

Table 3.1 - Relevant Legislation and Policies (cont)

Planning Provision	Comments	Relevant Licences/Approvals/Assessments
NSW Legislation - Acts		
Forestry Act 1916	The Department of Primary Industries (NSW Forests) manages the Ben Bullen and Wolgan State Forests.	The placement of a ventilation fan and easement within State Forest will require consultation with DPI (NSW Forests). A clearing licence is also required from DPI (Forests) to clear any trees within its lands.
Protection of the Environment Operations Act 1997 (PoEO Act)	The PoEO is administered by the Department of Environment (DEC) and Conservation and requires licences for environmental protection including waste, air, water and noise pollution control.	The development is not listed on Schedule 1 of the PoEO Act and therefore does not require an Environment Protection Licence.
Roads Act 1993	The *Roads Act 1993* is administered by the RTA, local Council or the Department of Lands. The RTA has jurisdiction over major roads, the local Council over minor roads, and the Department of Lands over Road Reserves.	No works are required on public roads as part of the proposed project. However, the construction phase will result in an increase in traffic on local roads. Traffic generating development is addressed by SEPP 11 (see above).
NSW Legislation - Acts		
National Parks and Wildlife Act 1974	This Act provides for the protection, preservation and management of all Aboriginal relics throughout NSW.	Under Part 3A of the EP&A Act, a Section 90 Consent and a Section 87 Preliminary Research Permit (required under the NPW Act to destroy a known site or undertake research) are not required where development consent is granted for a Major Project. However, any disturbance to archaeological objects must be undertaken in accordance with the conditions of development consent (refer to Section 4.3.4).
Threatened Species Conservation Act 1995	The TSC Act provides protection for threatened plants and animals native to NSW (excluding fish and marine vegetation which are protected under the *Fisheries Management Act 1994*). The Act integrates the conservation of threatened species into development approval processes under the EP&A Act. Under the EP&A Act, impacts on threatened species listed under the TSC Act are assessed by a seven-part test.	The habitats of a number of threatened species have been identified in the project area. The listed species have been assessed and it was determined that none of the local populations were likely to be impacted by the proposed development (refer to Section 4.3.3).

Table 3.1 - Relevant Legislation and Policies (cont)

Planning Provision	Comments	Relevant Licences/Approvals/Assessments
Drinking Water Catchments Regional Environmental Plan No.1	Sydney Catchment Authority (SCA).	The proposed development site is located within the upper reaches of the Cox's River Catchment and is therefore within the area to which this Plan applies. However, Section 75R of the EP&A Act provides that environmental planning instruments, other than SEPPs, do not apply to major projects defined under Part 3A of the Act.

3.2 Authority Consultation

The authority consultation process has commenced with initial contact with the Department of Planning (DoP). An initial project briefing has been provided to confirm the application of the Part 3A approval process to this proposal. Consultation with Lithgow City Council and Department of Primary Industries (NSW Forests) will also be undertaken as part of the initial consultation process.

The next phase of the consultation process will be the lodgement of the Project Application and this Preliminary Environmental Assessment with DoP who will consult with relevant agencies regarding the Environmental Assessment Requirements for the project.

Following their review of the Project Application, this Preliminary Environmental Assessment, and consultation with relevant agencies, DoP will issue the Environmental Assessment Requirements for the project.

In addition to DoP, the relevant agencies for this project include:

- Lithgow City Council;
- Department of Environment and Conservation (DEC);
- Sydney Catchment Authority (SCA);
- Roads and Traffic Authority (RTA);
- Department of Primary Industries (NSW Forests);
- Department of Primary Industries (Mineral Resources); and
- Department of Natural Resources.

3.3 Community Consultation

The community consultation program will build on the existing communication channels Baal Bone Colliery has with the community. The consultation process will involve contact and a request for feedback from:

- local residents (two residences are located approximately 1.5 kilometres from the site); and

- relevant interest groups including the Colong Foundation for Wilderness Ltd and Blue Mountains Conservation Society Inc. These organisations have been recently consulted in relation to the planned mining (Longwalls 29-31) and REF process but will be given specific information regarding the ventilation shaft proposal.

The views of all relevant stakeholders will be considered in the project design and the EA process.

4.0 Preliminary Environmental Assessment

4.1 Environment and Community Context

The proposed development site is located across the boundary of the Ben Bullen and Wolgan State Forests, in the upper reaches of the Cox's River catchment (see **Figure 2.1**). The ventilation shaft site is located on a ridgeline of the Great Dividing Range (the Wolgan Plateau) at an elevation of approximately 1040 metres AHD. It is located immediately to the west of an access track which runs off Wolgan Road. This access track forms the boundary of the Ben Bullen and Wolgan State Forests. The proposed transmission line runs in a north-north westerly direction immediately adjacent to the access track for approximately 500 metres. A small upper tributary of Paling Yard Creek is crossed twice by the proposed transmission line, near the existing substation which is built across an adjoining minor tributary. The substation is located at an elevation of approximately 960 metres AHD.

Average annual rainfall for the Lithgow area is approximately 850 mm (Corkery & Co 2005). Winter and summer total rainfalls are relatively consistent, although thunderstorms are more common in summer. Average annual evaporation is 1200 mm. Mean daily temperatures range from 12°C to 23°C in summer and -1°C to 11°C in winter. Strong westerly winds (>10m/s) are common in winter, while light northerly winds predominate in summer.

The soil across the ventilation shaft site and southerly section of the transmission line easement is characterised by the Newnes Plateau Soil Landscape (King 1993). Soils are shallow on crests and associated with rock outcrop. The loose quartz-rich sand (topsoil) contains sandstone fragments and is strongly to moderately acid. The subsoil consists of earthy sandy clay loam and is moderately to slightly acid. The erodibility of the soil is low to moderate but is susceptible to erosion following bushfire or logging (King 1993:30).

Soils in the northern section of the transmission line easement are characterised by the Hassans Walls Soil Landscape. The topsoil consists of brownish black loamy sand with abundant sandstone gravel and boulders. The subsoils consist of yellowish brown pedal clays. Severe erosion is common throughout this soil landscape (King 1993:52-53).

Land use within Ben Bullen State Forest and the area surrounding the proposed development consists of:

- forestry;

- mining and associated activities, eg. exploration;

- recreational 4WD and motorcycling; and

- bushwalking and camping activities.

Forestry and recreational activities, however, are infrequent within the specific proposed development site.

The nearest residential property to the proposed ventilation shaft is located approximately 1.5 kilometres to the north east.

4.2 Preliminary Environmental Risk Analysis

To assist in identifying the key environmental and community issues that require further assessment, a preliminary environmental risk analysis has been completed for the project and is included in **Appendix 1**.

The preliminary environmental risk analysis identifies ecology, cultural heritage and traffic as the main issues requiring further assessment in the EA.

The proposed approach to further consideration of the key environmental and community issues is discussed in **Section 4.3**.

4.3 Key Environment and Community Issues

4.3.1 Ecology

A flora and fauna assessment of the proposed ventilation shaft and powerline easement was undertaken by OzArk Environmental and Heritage Management Pty Ltd (OzArk) in September 2006.

Three vegetation types were mapped:

- Tablelands Sheltered Valley Forest;
- Sandstone Dry Ridgetop Woodland; and
- Tablelands Dry Woodland.

No threatened flora or fauna was identified by OzArk, however, based on habitat types, it was considered that there was potential for the following species listed under the *Threatened Species Conservation Act 1995* to occur within the project area:

- brown treekeeper (*Climateris picumnus*);
- gang-gang cockatoo (*Callocephalon fimbriatum*);
- large-eared pied bat (*Chalinolobus dwyeri*);
- eastern bent-wing bat (*Miniopterus shreibersii oceanensis*);
- eastern long-eared bat (*Nyctophilus timoriensis*);
- eastern false pipistrelle (*Falsistrellus tasmaniensis*); and

- squirrel glider (*Petaurus norfolcensis*).

Seven Part Tests were undertaken for the above species and it was determined that none of the local populations were likely to be impacted by the proposed development.

The eastern long-eared bat is also listed on the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, however it was determined that the proposed development would not have a significant impact on the species.

The detailed flora and fauna assessment will be included in the EA.

4.3.2 Cultural Heritage

A cultural heritage inspection undertaken by the Bathurst Local Aboriginal Land Council (Bathurst LALC, September 2006) concluded that there were no cultural heritage issues associated with the proposed powerline easement or ventilation shaft site.

A heritage assessment that complies with DEC's guidelines has been undertaken by OzArk in consultation with relevant Aboriginal groups. The results of this assessment will be incorporated into the EA.

4.3.3 Water Quality, Erosion and Sedimentation

As discussed in **Section 4.1**, the proposed development is located within the upper reaches of the Cox's River. There are three potential sources of water contamination associated with the construction and operation phases. These are:

- sediment generated from access tracks and areas cleared for the construction of the ventilation shaft and installation of the power lines;

- leakage from the water circulation system and sumps which are required during shaft raise boring; and

- leakages of fluids (hydrocarbons or coolants) from the machinery associated with shaft raise boring and installation of the power line.

Adequate safeguards will be put in place to minimise these potential sources of contamination. For example, sediment fencing will be installed downslope of any ground disturbance activity, and on-site machinery will be inspected regularly for leakages. Hydrology and water quality are therefore not considered to be key issues but relevant controls will be included in the EA.

4.3.4 Visual Impact

Visual impacts associated with the proposed development are expected to be short term and minimal. As discussed in **Section 2.3**, the power poles will be placed in order to minimise the need for clearing and lopping. The visual assessment contained in the EA will discuss the general scenic amenity of the area and confirm that there are no potential views of the ventilation facility and powerline easement from surrounding residences or public viewing locations (eg. roads). Where appropriate, measures will be proposed to mitigate the visual impacts associated with the development.

4.3.5 Traffic

As identified in the preliminary environmental risk analysis (**Appendix 1**), the proposed project will increase local traffic flows during the construction stage but will not have a significant impact during operation. There will be increased heavy vehicle movements associated with the delivery of water (six to eight water tanker loads per day for a period of 10-12 weeks) and other machinery and materials.

A sufficient assessment will be completed as part of the EA to assess the impact of traffic flows associated with the project on the local road network. It will focus on the ability of the road network to accommodate the projected traffic flows and identify measures that will minimise any short term impacts.

4.3.6 Energy and Greenhouse Management

The proposed development will result in the emission of greenhouse gasses through the emission of ventilation air, during the combustion of diesel fuel used in diesel powered equipment, and indirectly through the use of electricity to power the ventilation fan.

A greenhouse gas emission assessment will be completed as part of the Environmental Assessment, including calculation of predicted emissions and identification of appropriate mitigation measures to minimise greenhouse gas emissions during construction and operation.

4.3.7 Noise

There is a substantial noise buffer zone around the site due to the location within State Forest and natural topographic shielding. Preliminary noise advice from Heggies Pty Ltd (Heggies) indicates that noise is not considered to be a significant issue, however further assessment will be undertaken to confirm this as part of the EA.

The nearest residences to the proposed ventilation shaft site are approximately 1.5 kilometres to the southeast and comprise two residences on a rural property. The next nearest residences are in excess of two kilometres from the site. The facility has been designed to minimise noise impacts.

Noise measurements have been made for a similar existing facility and these will be incorporated into the construction and operational noise assessment that will be undertaken by Heggies and incorporated into the EA.

4.3.8 Air Quality

As for noise, air quality is not considered a significant issue due to the location of the site and the nature of the development. An air quality assessment will be undertaken by Heggies and the results incorporated into the EA to confirm this is the case.

4.3.9 Rehabilitation and Site Decommissioning

Once longwalls 29-31 have been extracted all surface infrastructure associated with the proposed development will be removed and the disturbed land rehabilitated. The scale of the development means that the required rehabilitation works will be minor, however details regarding rehabilitation and site decommissioning will be included in the EA.

4.3.10 Socio-Economic

The project will have significant socio-economic benefit as it facilitates the continuation of longwall mining at Baal Bone Colliery for a further two to three years.

The detrimental socio-economic impacts of the proposed powerline easement and ventilation shaft will be minimal. The facilities are located within a State Forest and the closest residence is 1.5 kilometres away.

Further details regarding socio-economic considerations will be included in the EA. The assessment will document the effect (if any) on nearby communities; and analyse the compatibility of the proposal with local community values and existing land uses (eg. bushwalking and other recreational activities within Ben Bullen State Forest).

The fact that Ben Bullen State Forest has been identified by the State government for possible inclusion in a State Conservation Area will be taken into consideration for the assessment.

4.3.11 Bushfire

Appropriate bushfire controls will be documented in the EA and the impact of any such controls assessed.

5.0 Project Schedule

Baal Bone Colliery is seeking to lodge the EA in early April 2007. Project Approval is sought by July 2007. Construction will commence as soon as possible following approval.

6.0 References

Bathurst Local Aboriginal Land Council, correspondence to Baal Bone Colliery, 20 September 2006.

King, D.P. 1993. *Soil Landscapes of the Wallerawang 1:100 000 Sheet Report*. Department of Conservation and Land Management, NSW.

Minter Ellison Lawyers, correspondence to Xstrata Coal, 4 October 2006 and 29 September 2006.

OzArk Environmental & Heritage Management Pty Ltd. 2006. *Ecological Assessment: Proposed 1.7 km, 11 kV Electricity Easement and Ventilation Compound*. Report to R.W. Corkery & Co. Pty Ltd.

R.W. Corkery & Co. Pty Ltd. 2006. *Addendum to Review of Environmental Factors for Exploration Program for Proposed Longwall Panels 29 to 31*. Report to Baal Bone Colliery.

R.W. Corkery & Co. Pty Ltd. 2005. *Review of Environmental Factors for Exploration Program for Proposed Longwall Panels 29 to 31*. Report to Baal Bone Colliery.

APPENDIX 1

Preliminary Environmental Risk Analysis

Appendix 1 - Preliminary Environmental Risk Analysis

An environmental risk assessment has been undertaken for the Project to identify the key issues which warrant further detailed assessment and discussion. The methodology used for this process follows the general principles outlined in Australian Standard AS/NZS 4360:1999 Risk Management and Environmental Risk Management – Principles and Process (Standards Australia, 2000). The results of the risk assessment are included in **Attachment A**.

The method used for the environmental risk assessment encompasses the following key steps:

1. Establish the context for the risk assessment process;

2. Identify environmental risks;

3. Analyse risks; and

4. Evaluate risks to determine significant issues

Each of these steps is discussed further below.

Establish the Context

The risk assessment undertaken for the Project considers risks to the natural environment and members of the public. The 'Project' was considered to be the processes and activities described in **Section 2.3** of the Preliminary Environmental Assessment, categorized as shown in **Table 1**.

Table 1 - Process Areas and Activities Considered

Process Area	Process Boundary	Activities
Installation	Installation of ventilation shaft to allow continued longwall mining.	Constructing a shaft within Ben Bullen State Forest using raised bore techniques. Installation of a ventilation fan on the shaft. Installation of a powerline (including limited vegetation clearance) between existing substation and new ventilation shaft.
Operation	Operation of ventilation shaft to facilitate extraction of Longwalls 29-31.	Operation of ventilation fan and continuous power supply from existing substation.
Ancillary Areas	Other activities undertaken to support installation and operation.	Maintenance.

Risk Identification

Risk identification involves identifying the environmental risks to be managed, and in its simplest form involves the analysis of the severity and frequency of potential impacts and the operational processes underlying any impact.

In order to provide a systematic framework to identify environmental risks, the following basic process was used:

1. select a component of the surrounding environment that may be impacted by the Project;

2. identify the activities from Table 1 that may affect the value; and

3. identify the potential environmental impacts (positive or negative, acute or chronic) for each value, as a result of these activities.

Risk Analysis

Risks are typically analysed by combining possible consequences and their likelihood, in the context of existing measures to control the risk. The consequence and likelihood of each risk determines the level of risk.

Each risk was assessed using a five level qualitative ranking of consequence and likelihood as listed in **Table 2** and **Table 3** respectively. This yields a five by five risk analysis matrix and results in four levels of risk: "catastrophic", "major", "moderate" and "minor", as shown in **Table 4**.

Table 2 - Qualitative Measures of Environmental Consequence

Severity Level	Natural Environment	Legal / Government	Heritage	Community/Reputation/ Media
(1) Insignificant	Limited damage to minimal area of low significance.	Low-level legal issue. On the spot fine. Technical non-compliance prosecution unlikely. Ongoing scrutiny / attention from regulator.	Low-level repairable damage to commonplace structures.	Low level social impacts. Public concern restricted to local complaints. Could not cause injury or disease to people.
(2) Minor	Minor effects on biological or physical environment. Minor short-medium term damage to small area of limited significance.	Minor legal issues, non-compliances and breaches of regulation. Minor prosecution or litigation possible. Significant hardship from regulator.	Minor damage to items of low cultural or heritage significance. Mostly repairable. Minor infringement of cultural heritage values.	Minor medium-term social impacts on local population. Could cause first aid injury to people. Minor, adverse local public or media attention and complaints.
(3) Moderate	Moderate effects on biological or physical environment (air, water) but not affecting ecosystem function. Moderate short-medium term widespread impacts (e.g. significant spills).	Serious breach of regulation with investigation or report to authority with prosecution or moderate fine possible. Significant difficulties in gaining approvals.	Substantial damage to items of moderate cultural or heritage significance. Infringement of cultural heritage / scared locations.	Ongoing social issues. Could cause injury to people which requires medical treatment. Attention from regional media and/or heightened concern by local community. Criticism by NGOs. Environmental credentials moderately affected.
(4) Major	Serious environmental effects with come impairment of ecosystem function. Relatively widespread medium-long term impacts.	Major breach of regulation with potential major fine and/or investigation and prosecution by authority. Major litigation. Project approval seriously affected.	Major permanent damage to items of high cultural or heritage significance. Significant infringement and disregard of cultural heritage values.	On-going serious social issues. Could cause serious injury or disease to people. Significant adverse national media/public or NGO attention. Environment/management credentials significantly tarnished.

Table 2 - Qualitative Measures of Environmental Consequence (cont)

Severity Level	Natural Environment	Legal / Government	Heritage	Community/Reputation/ Media
(5) Catastrophic	Very serious environmental effects with impairment of ecosystem function. Long term, widespread effects on significant environment (e.g. national park).	Investigation by authority with significant prosecution and fines. Very serious litigation, including class actions. License to operate threatened.	Total destruction of items of high cultural or heritage significance. Highly offensive infringements of cultural heritage.	Very serious widespread social impacts with potential to significantly affect the well being of the local community. Could kill or permanently disable people. Serious public or media outcry (international coverage). Damaging NGO campaign. Reputation severely tarnished. Share price may be affected.

Table 3 - Qualitative Measure of Likelihood

Level	Descriptor	Description	Guideline
A	Almost Certain	Consequence is expected to occur in most circumstances.	Occurs more than once per month.
B	Likely	Consequence will probably occur in most circumstances.	Occurs once every 1 month – 1 year.
C	Occasionally	Consequence should occur at some time.	Occurs once every 1 year - 10 years
D	Unlikely	Consequence could occur at some time.	Occurs once every 10 years – 100 years.
E	Rare	Consequence may only occur in exceptional circumstances.	Occurs less than once every 100 years.

Source: AS/NZS 4360:1999 Risk Management

Table 4 - Qualitative Risk Matrix

	Maximum Reasonable Consequence				
Likelihood of the Consequence	(1) Insignificant	(2) Minor	(3) Moderate	(4) Major	(5) Catastrophic
(A) Almost certain	High	High	Extreme	Extreme	Extreme
(B) Likely	Moderate	High	High	Extreme	Extreme
(C) Occasionally	Low	Moderate	High	Extreme	Extreme
(D) Unlikely	Low	Low	Moderate	High	Extreme
(E) Rare	Low	Low	Moderate	High	High

Source: AS/NZS 4360:1999 Risk Management

Although the risk rating gives no quantification of the actual value of the risk for a particular aspect, it does allow a relative comparison between issues to enable risks to be prioritised, facilitate informed decisions about treating risks and help identify whether a risk is acceptable.

Table 5 shows the format used for the Project environmental risk assessment contained in **Attachment A**.

Table 5 – Format for Preliminary Project Environmental Risk Assessment

Project Activities	Environmental Value	Potential Impacts/ Consequences	Status and Proposed Control	Risk Assessment	Further Assessment required	Key Issue
Identifies the Project's activities that may affect the Environmental Value.	Components of the surrounding environment that can be affected by the Project.	This describes any change to the environment, whether adverse or beneficial, wholly or partly resulting from the Project's activities.	Details current understanding of the existing environment and existing controls.	Assessment of likelihood, consequence and risk score. Assumes no controls.	Identifies potential impacts that warrant further assessment based on risk of potential impacts.	Highlights the key issues requiring further assessment.

Risk Evaluation

Risk evaluation concerns setting priorities for decisions about risk. The purpose of risk evaluation is to compare risks against significance criteria to determine the degree of assessment required. The application of significance criteria will reduce the number of activities that require specific management attention and provides an opportunity to prioritise environmental issues based on predetermined criteria.

Although guidelines and regulations provide great detail on risk identification and characterisation, there is less guidance on what constitutes an acceptable level of risk. This is because the development of risk acceptance criteria is quite subjective and is not an exact science or based on a complex formula. For each risk assessment process there is a degree of flexibility in defining its own criteria to determine which impacts are potentially "significant" and which are not. For the purposes of this Preliminary Environmental Assessment, significant risks have been defined as those with a risk rating of high or extreme, as defined by **Table 4**.

It is important to note that certain impacts associated with the Project's activities may be predetermined as significant by State or Federal legislation. These 'regulated' impacts, whilst not always rated as significant based on risk score alone, will also require further assessment to be undertaken.

Attachment A

Baal Bone Colliery (Longwalls 29-31) Ventilation Shaft and Powerline Easement

Preliminary Environmental Risk Analysis

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
INSTALLATION PHASE								
Installation of ventilation shaft and powerline easement.	Noise	Degradation of noise amenity (cumulative)	The installation phase is unlikely to result in significant noise impacts because the proposed facility is located within a State Forest. The nearest residence is approximately 1.5 kilometres away.	1	E	L	Further assessment to confirm minimal impact.	No
	Dust generation	Degradation of air quality	Low potential for significant dust generation during installation phase. Controls will be put in place.	1	D	L	Further assessment to confirm minimal impact.	No
	Ecology	Loss of native flora and fauna.	The ventilation shaft site is located within a previously cleared area; however some clearing will still be required. Limited clearing and lopping will be required prior to installation of powerline easement. An assessment of the potential impacts of the project on ecological values has been completed.	2	C	M	An assessment of the potential impacts of the project on ecological values has been completed.	Yes
	Cultural Heritage	Disturbance of Aboriginal places or objects.	Limited clearing and ground surface disturbance will be required. A full assessment of the potential impacts of the project on cultural heritage values will be completed.	2	C	M	A full assessment of the potential impacts of the project on cultural heritage is required.	Yes

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
	Water Quality, Erosion and Sedimentation	Sedimentation of local waterways.	Controls will be put in place to mitigate potential impact from project. Controls will be designed and constructed in accordance with *Soils and Construction* (Landcom 2004).	1	E	L	No further assessment required, however project specific controls will be detailed.	No
	Visual Amenity	Aesthetics of cleared areas and exposed earthworks and construction works.	The construction phase will be relatively short in duration. No further assessment of installation phase visual impacts is therefore considered necessary.	1	E	L	No further assessment required.	No
	Traffic	Supply of machinery and materials for construction resulting in increased traffic.	The project will result in an increase in traffic (including heavy vehicles) on the local road network.	2	C	M	An assessment of construction phase traffic is required.	Yes
OPERATION PHASE								
Operation of ventilation shaft and power supply.	Noise	Degradation of noise amenity (cumulative).	Operation of ventilation shaft has potential to increase noise generation; however project located away from residences within State Forest. Impact will be short term (approximately two years).	1	D	L	Further assessment to confirm minimal impact.	No
	Dust generation	Degradation of air quality.	Operation of ventilation shaft has potential to increase dust generation.	1	D	L	Further assessment to confirm minimal impact.	No
	Water Quality, Erosion and Sedimentation	Sedimentation of local waterways.	Controls will be put in place to mitigate potential impacts. These will include revegetation and sediment fences where required.	1	E	L	No further assessment required, however project specific controls will be detailed.	No
	Visual Amenity	Aesthetics of ventilation shaft and powerline easement.	Facilities will not be visible from public viewing locations. An assessment of visual impacts will be completed to confirm this.	1	D	L	Further assessment to confirm minimal impact.	No
	Traffic	Increased traffic.	The project will not result in a significant increase in traffic on the local road network.	1	E	L	No further assessment required.	No

Activity	Environmental Value	Potential Impact	Status and Proposed Control	Risk Assessment			Further Assessment Requirements	Key Issue?
				C	L	R		
	Energy and Greenhouse	Emission of greenhouse gases.	The operation of the ventilation shaft will require use of electricity, diesel and petrol. The greenhouse gas emissions resulting from this energy consumption will be assessed.	1	B	M	A greenhouse gas assessment is required.	Yes
ANCILLARY ACTIVITIES AND ISSUES								
Maintenance	Waste, oil and grease storage	Soil and/or water contamination from spills or leaks.	All fuels, oils, grease, etc will be collected and handled using systems designed and operated in accordance with relevant legislation, Australian standards and DEC guidelines (eg. stored in bunded areas).	1	C	L	No further assessment is required.	No

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