Bloomfield Colliery

Project Approval No. 07_0087

Extension of the Project Approval Area for out-of-pit overburden emplacement and rehabilitation, alternative haul road and powerline relocation.

Application for a Modification to the Minister's Consent Pursuant to Section 75W of the *Environmental Planning and Assessment Act 1979*

APPENDICES

August 2010

Appendix A - Director-General's Requirements – Section 75W Modification

Major Projects Assessment
Mining & Industry

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Our ref: S07/01215

Mr Steve Dunn
General Manager, Technical Services
Bloomfield Collieries Pty Limited
PO Box 4
EAST MAITLAND NSW 2323

Dear Mr Dunn

Bloomfield Coal Project
Section 75W Modification (07_0087 MOD 1)
Director-General's Requirements

The Department has received your application to modify the approval for the Bloomfield Coal Project (07_0087 MOD 1) under section 75W of the *Environmental Planning and Assessment Act 1979*.

I have attached the Director-General's requirements (DGRs) for the proposed modification. Please note that the Director-General may alter these requirements at any time.

If the proposed modification is likely to have a significant impact on matters of National Environmental Significance, it will require an approval under the Commonwealth *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act). This approval is in addition to any approvals required under NSW legislation. It is your responsibility to contact the Department of Environment, Water, Heritage and the Arts in Canberra (6274 1111 or http://www.environment.gov.au) to determine if the proposal requires an approval under the EPBC Act. The Commonwealth Government has accredited the NSW environmental assessment process, so if it is determined that an approval is required under the EPBC Act, please contact the Department immediately as supplementary Director-General's requirements may need to be issued.

I would appreciate it if you would contact the Department at least two weeks before you propose to submit the Environmental Assessment for the modification. This will enable the Department to determine the:

- applicable fee (see Division 1A, Part 15 of the *Environmental Planning and Assessment Regulation 2000*); and
- number of copies (hard-copy and CD-ROM) of the Environmental Assessment that will be required for exhibition purposes.

Following receipt the Department will review the Environmental Assessment in consultation with the relevant agencies to determine if it adequately addresses the Director-General's requirements. The Department may require you to revise the Environmental Assessment prior to public exhibition.

The Department is required to make all the relevant information associated with the modification publicly available on its website. Consequently, I would appreciate it if you would ensure that all the documents you subsequently submit to the Department are in a suitable format for the web, and arrange for the Environmental Assessment to be hosted on a suitable website.

If you have any enquiries about these requirements, please contact Paul Freeman.

Yours sincerely

DKitto 14/12/09

David Kitto
Director
Major Development Assessment
As delegate for the Director-General

Director-General's Requirements

Section 75F of the *Environmental Planning and Assessment Act 1979*

Application number	07_0087 MOD 1
Modification Description	Modifying the Bloomfield Coal Project, including: • emplacing overburden on, reshaping and rehabilitating an area of previously rehabilitated land south-east of the S Cut Pit; • reshaping and rehabilitating two non-vegetated areas, north of the Creek Cut Pit and east of the S Cut Pit respectively; • constructing a new haul road from the northern area of the Creek Cut Pit to the washery stockpile; and • establishing an easement and overhead powerline west of the S Cut Pit.
Location	North of John Renshaw Drive, Buttai.
Proponent	Bloomfield Collieries Pty Limited.
Date of Issue	14 December 2009
General Requirements	The Environmental Assessment of the proposed modification must include: • an executive summary; • a detailed description of: - existing and approved operations and infrastructure on site; and - the existing environmental management and monitoring regime on site; • a detailed description of the modification, including the: - need for the modification; - alternatives considered; - likely interactions between existing and approved mining operations; - likely staging of the modification; and - plans of any proposed construction works; • a risk assessment of the potential environmental impacts of the modification, identifying the key issues for further assessment; • a detailed assessment of the key issues specified below, and any other significant issues identified in the risk assessment (see above), which includes: - a description of the existing environment, using sufficient baseline data; - an assessment of the potential impacts of all stages of the modification, including any cumulative impacts associated with the concurrent operation of the modification with any other existing or approved mining operations in the region, taking into consideration any relevant policies, guidelines, plans and statutory provisions (see below); and - a description of the measures that would be implemented to avoid, minimise, mitigate and/or offset the potential impacts of the modification, including detailed contingency plans for managing any significant risks to the environment; • a statement of commitments, outlining all the proposed environmental management and monitoring measures; • a conclusion justifying the modification on economic, social and environmental grounds, taking into consideration whether the modification is consistent with the objects of the *Environmental Planning & Assessment Act 1979*; • a signed statement from the author of the Environmental Assessment, certifying that the information contained within the document is neither false nor misleading.

Key Issues	• **Rehabilitation and Final Landform** – including a justification of the revised final landform; how the site would be progressively rehabilitated; and the measures which would be put in place for the long term protection and management of the site; • **Biodiversity** – including**:** - accurate predictions of any vegetation clearing on site; - a detailed assessment of the potential impacts of the project on any terrestrial and aquatic threatened species, populations, ecological communities or their habitats; and - a detailed description of the measures that would be implemented to maintain or improve the biodiversity values of the surrounding region in the medium to long term; • **Air Quality**; • **Noise** – including operational and construction noise; • **Greenhouse Gases**; • **Heritage** – both Aboriginal and non-Aboriginal; and • **Visual**.
References	The environmental assessment of the key issues listed above must take into account relevant guidelines, policies, and plans. While not exhaustive, the following attachment contains a list of guidelines, policies and plans that may be relevant to the environmental assessment of this modification.
Consultation	During the preparation of the EA, you should consult with the relevant local, State or Commonwealth government authorities, service providers, community groups or affected landowners. The consultation process and the issues raised must be described in the Environmental Assessment. In particular you should consult with: • Department of Environment, Climate Change and Water; • NSW Office of Water (within DECCW); • Department of Industry and Investment; • Cessnock City Council; and • Maitland City Council.
Deemed refusal period	60 days

Policies, Guidelines & Plans

Aspect	Policy / Methodology
Rehabilitation	
	Mine Rehabilitation – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)
	Mine Closure and Completion – Leading Practice Sustainable Development Program for the Mining Industry (Commonwealth of Australia)
	Strategic Framework for Mine Closure (ANZMEC/MCA)
Flora & Fauna	
	Draft Guidelines for Threatened Species Assessment under Part 3A of the *Environmental Planning and Assessment Act 1979* (DEC)
	Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 - Guide to implementation in NSW (DoP)
Noise	
	NSW Industrial Noise Policy (DEC)
	Environmental Criteria for Road Traffic Noise (NSW EPA)
	Interim Construction Noise Guideline (DECC)
Air Quality	
	Approved Methods for the Modelling and Assessment of Air Pollutants in NSW (DEC)
	Approved Methods for the Sampling and Analysis of Air Pollutants in NSW (DEC)
Greenhouse Gas	
	National Greenhouse Accounts (NGA) Factors
Heritage	
Aboriginal	Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC)
	NSW Heritage Manual (NSW Heritage Office & DUAP)
Non- Aboriginal	The Burra Charter (The Australia ICOMOS charter for places of cultural significance)

Appendix B – Biodiversity Assessment

Bloomfield Colliery East Maitland

Part 3A variation ecology report

HUNTER ECO

May 2010

Bloomfield Colliery Part 3A variation ecology report

HUNTER ECO

Colin Driscoll
Environmental Biologist
NPWS Scientific Licence S10565
Exp 31 January 2011

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Bloomfield Colliery Part 3A variation ecology report

1 Description of the Proposed Modifications – Bloomfield Colliery

During preparation of the Environmental Assessment that accompanied the original Part 3A application (Business Environment, 2008), the PA Area only included those areas of the larger existing Bloomfield Colliery site that were specifically required for active mining and other activities associated with the winning of coal. Rehabilitated areas that were within the existing mine lease and adjacent to the open cut pits were not included.

Section 6 of the Mining Amendment Act 2008 states that "*A person must not carry out a mining purpose specified for the purposes of this section except in accordance with an authorisation that is in force in respect of the land where the purpose is carried out*."

As the Mining Lease (being the "authorisation" required by Section 6 quoted above) to be granted to Bloomfield for the approved operation is only for that area included in the Approval under Part 3A of the EP&A Act, Bloomfield are seeking to extend the PA Area so that it may be included in the Mining Lease, and therefore satisfy the *Mining Amendment Act 2008*.

Bloomfield therefore seeks to extend the boundary of the Project Application Area to include all areas of previous rehabilitation associated with its S Cut and Creek Cut operations, including those areas requiring improvement works as described following. Only those activities as described following and associated with the mining operation will be undertaken within this extended area.

1.1 Construction of an Overhead Powerline and Easement

An existing overhead powerline and easement is located to the north-west of the Bloomfield PA Area. This line, as shown on **Figure 1**, extends from a previous open cut mine area in the north of the Bloomfield Colliery site into the current Creek Cut area. The powerline currently provides power for the water cart filling station, water pumps and rope shovel.

To enable the approved mining areas of Creek Cut and S Cut to proceed, the southern section of this powerline and associated infrastructure, within the current PA Area, needs to be relocated.

It is proposed to relocate a **330 metre** section of the powerline as shown on **Figure 1.** This would require construction of a 40 metre wide easement, removing approximately one hectare of native vegetation outside the existing project area plus approximately 10 hectares of native vegetation within the existing approved project area, including approximately 7ha Lower Hunter Spotted Gum-Ironbark Forest Endangered Ecological Community (LHSGIF EEC).

The area within the approved project area is required for infrastructure associated with the power supply to the face shovel and mine water management. It includes: transformers, earth leakage grids, cables and powerlines. This area is outside current mining areas.

Construction would consist of marking of the easement, vegetation clearing within the easement and the existing project area, installation of posts and lines, connection to the existing line and relocation of transformers, earth grids etc. The existing line and posts would then be removed.

1.2 South-East Area - Overburden Dumping and Rehabilitation

An out-of-pit area to the east of the approved haul road ("Save-a-Mile Highway") has previously been rehabilitated but not to current standards. This area is approximately **14 hectares** in size and shown on **Figure 1**. To maximise operational efficiencies and improve final land shaping and vegetation cover in this area, Bloomfield proposes to place approximately 1.2 million bank cubic metres (bcm's) of overburden on this area prior to reshaping and revegetation to current rehabilitation standards. Works would occur over approximately twelve months during the early stages of the approved "Stage 2" of mining.

This out-of-pit emplacement and rehabilitation does not alter the approved mine plan or tonnages as this site would replace the previous emplacement location approximately 850 metres south-west at similar RL's.

Equipment proposed for these works will be that used for the currently approved operation as described by Section 2.6.2 of the EA (Business Environment, 2008), with no additional equipment to be introduced for these works. Rear dump haul trucks will transport overburden material to the area with dozers pushing and shaping material prior to topsoil application and seeding.

1.3 Northern and South-Eastern Areas – Out-of-Pit Reshaping and Rehabilitation

Two out-of-pit areas of approximately **10 hectares** and **7 hectares** respectively, as shown on **Figure 1**, are former mining areas consisting of overburden material with some minor shaping and grass seeding. There is minimal native vegetation and any native vegetation that does exist has grown from adjacent tree seeding. To improve the rehabilitation of these areas and revegetate to current standards, minor

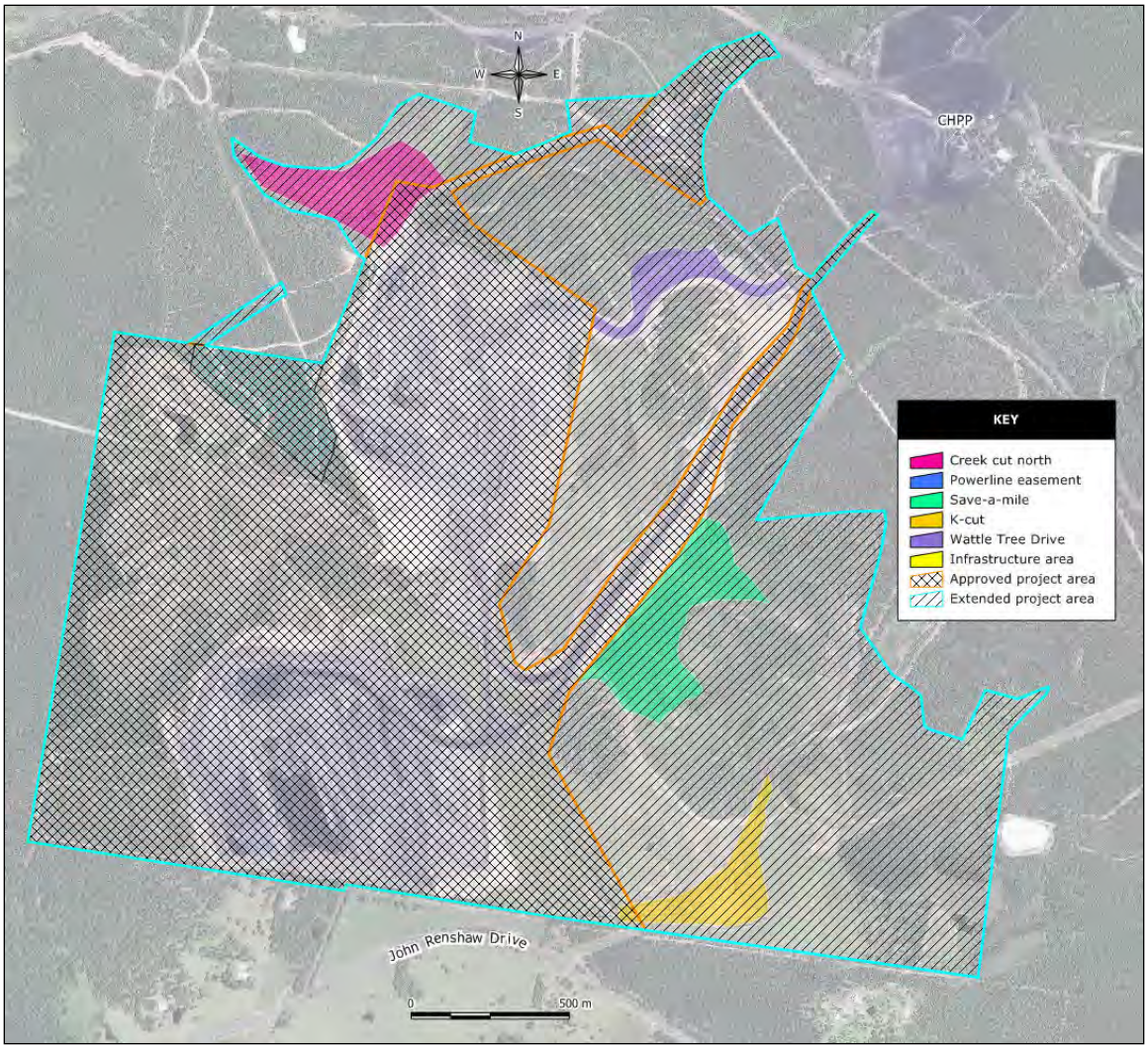

Figure 1: The application and disturbance areas

import of overburden to reshape and improve drainage is proposed, as well as revegetation. The amount of overburden material that would be transported to these areas would be 50,000 and 100,000 bcm's respectively. Works would be undertaken over approximately **6 months during Stage 2.**

1.4 Development of Wattle Tree Drive as an Alternative Haul Route

An existing access track between the northern open cut pit (Creek Cut) and the north-eastern end of the haul road leading to the washery stockpiles has been in existence for some years. Bloomfield proposes to develop this track ("Wattle Tree Drive") as an alternative haul road and general access road between the northern pit and the washery stockpiles. The location of this proposed alternative haul route is shown on **Figure 1**. The alternative haul route will be approximately **750 metres** in length.

Use of this alternative route will reduce haulage distances during times when coal is being extracted from the northern areas of Creek Cut. Some cut and fill and slope stabilisation works will be required to construct the road, which will be used by coal trucks and general vehicles.

To construct this alternative haul road, the existing track will require widening and levelling. The southern and northern batters will be shaped and stabilised as part of the construction works.

2 Methods

Of the proposed additional areas as described above, only the relocated powerline easement and infrastructure area would necessitate the removal of remnant vegetation. The other areas are located over either open ground or rehabilitated opencut areas.

Given that the area to be cleared for the relocated powerline easement is continuous with the area referred to as the eastern block in the 2009 application, this ecology assessment will be based on the data from that original report. Data from the Atlas of NSW Wildlife has been updated and a habitat tree survey was conducted in the area to be cleared.

The following described methods are those used to investigate the ecology of the eastern block from the 2009 application.

2.1 Threatened species, ecological communities and key threatening processes

Schedules 1 and 2 of the TSC Act contain lists of flora and fauna species and communities, which have been determined by the NSW Scientific Committee as being under threat of serious decline that could ultimately lead to extinction. The DEC & DPI (2005) guidelines for the assessment of threatened species for Part 3A applications provides a test for the impact of any proposal on threatened species occurring or considered as likely to occur in the investigation area.

Schedule 3 of the TSC Act contains a list of 'key threatening processes' deemed to be processes that have a negative impact on threatened species, populations or communities.

An assessment of the threatened species and endangered communities that could possibly occur on the subject site was made using Atlas of NSW Wildlife records from within a 5km radius of the subject site. Next, based on information available concerning the habitat requirements of these species (drawn from http://www.threatenedspecies.environment.nsw.gov.au/tsprofile/), an assessment was made as to the likelihood of any of the reported threatened species occurring on the subject site or using the habitat of the subject site as an essential part of a foraging range.

A field survey was then conducted using the list of threatened species as a guide to species potentially likely to occur on the subject site. The survey was however, not limited to the species reported on the database extract. Searches were carried out for any species listed on Schedules 1 and 2 of the TSC Act that were considered likely to occur in the type of vegetative habitat present on the subject site.

The likelihood of any 'key threatening processes' (KTP) occurring on the subject site was also assessed.

2.2 Flora

Systematic transect searches were conducted across the whole area. This method improves the likelihood of finding any rare or threatened species. A floristic list was compiled for each different vegetation community from the transect searches as well as from a standard .04ha floristic plot placed in a representative part of each community in each vegetation block (using the Braun-Blanquet 1-6 scale for cover-abundance). **Figure 2** shows the location of plots and transects used for the 2009 application.

Floristic nomenclature was based on Harden (1992, 1993, 2000, 2002) with subsequent revisions as published on PlantNet (http://plantnet.rbgsyd.nsw.gov.au). Targeted searches were conducted for those threatened plant species that were identified during the preliminary assessment as likely to occur on the subject site. Plants listed under the ROTAP scheme (Briggs and Leigh 1996) were also considered in this assessment along with species and vegetation deemed to be of local conservation significance.

2.3 Vegetative Community Type Determination

The remnant vegetation for the whole of the Bloomfield, Ashtonfield and Donaldson areas has been mapped previously (Driscoll & Bell 2006) however while this mapping was ground-truthed, the area of the powerline easement and infrastructure area was inspected to confirm the communities present.

2.4 Fauna

The fauna assessment involved ground and arboreal trapping, targeted searches, spotlighting and the broadcasting of the calls of threatened owls. **Figure 2** shows the location of the various components of the fauna survey that was conducted for the 2009 application in relation to the powerline easement.

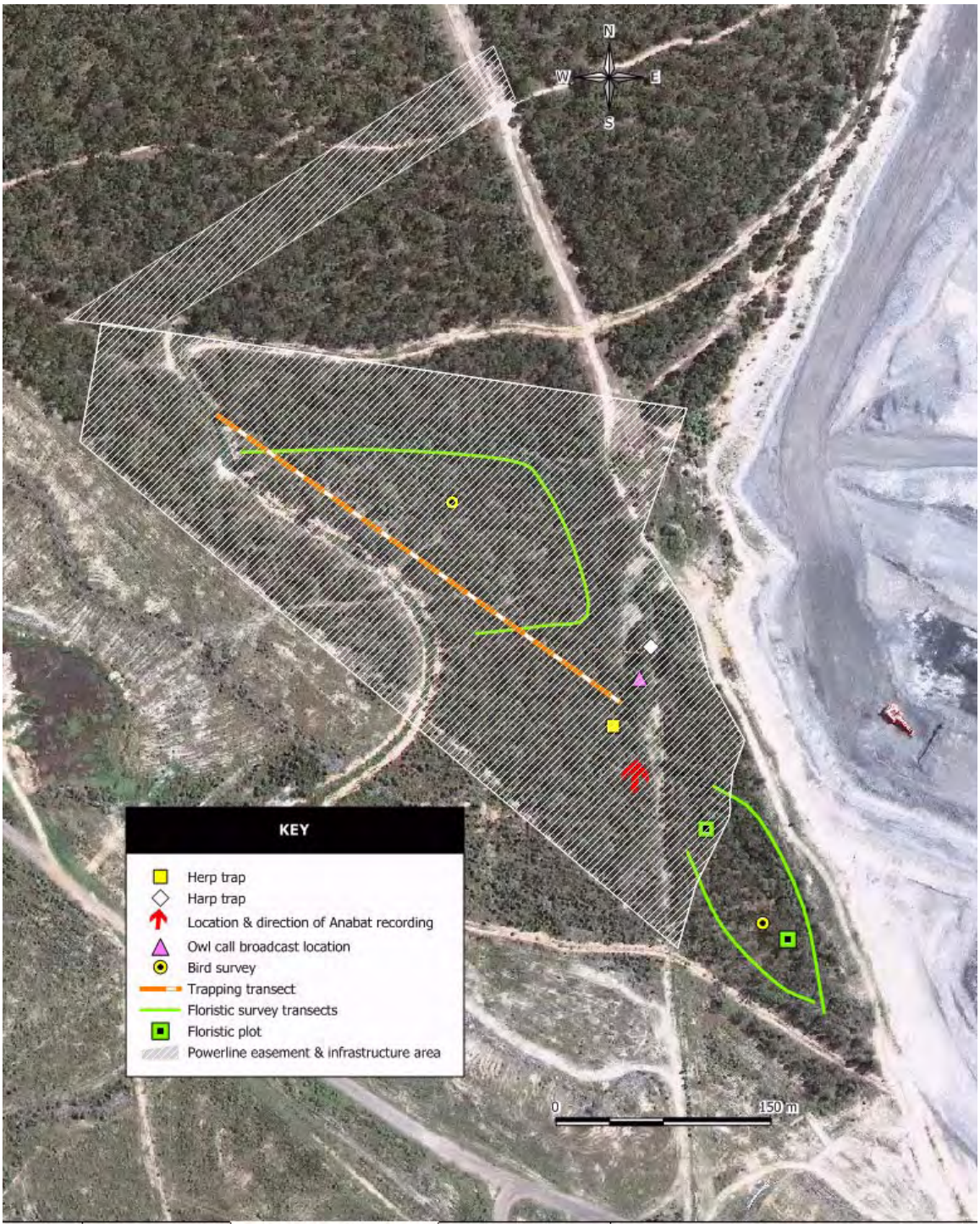

Figure 2: Flora and fauna survey locations

2.4.1 Arboreal Mammals

Trapping transects were designed to assess the presence of arboreal and terrestrial mammals utilising the subject site. For arboreal mammals, Elliot B traps and hair tubes were placed in trees at heights of 3m or above, along two transects and baited with a mixture of rolled oats, honey, peanut butter and treacle. The trunks of trees with the traps were sprayed with a honey and water mixture. These traps were check daily for arboreal species and wafers from the hair tubes were collected after the four-night period and checked for the presence of hair samples. Hair identification methods followed those of Brunner *et al.* (2002).

Spotlighting was undertaken from dusk for a 3-hour period on one night to identify the presence of any arboreal mammals. Trees were inspected (during daylight hours) for the presence of habitat hollows and if present these were watched at dusk to see if any nocturnal birds or mammals emerged.

2.4.2 Terrestrial Mammals

In order to identify any terrestrial mammals, Elliot A traps, Elliot B traps and Cage traps were placed along transects at regular intervals. All traps were baited with a mix of rolled oats, honey, peanut butter and treacle. The traps were set in position for four consecutive nights and checked each morning.

Spotlighting from dusk for a 3-hour period on one night was also undertaken to identify the presence of any terrestrial mammals. Careful daytime searches were also conducted for the presence of fauna activity such as diggings, droppings or scratch marks.

2.4.3 Bats

An Anabat II bat-call recorder (Titley Electronics, Ballina) was used to record the calls of any Microchiropteran bats feeding in the area. The unit was set up at dusk and recording occurred for 2 hours continuous on one night at two locations. Spotlighting searches of blossoming trees were undertaken to identify any Megachiropteran bat species.

2.4.4 Birds

The method employed to survey diurnal birds was an area search of vegetation on the subject site. Four plots, each approximately 1ha in size, were surveyed for 30 minutes. Birds were identified either visually, with the aid of binoculars, or by call interpretation. Surveys were conducted in the morning when bird activity is maximised (Bibby *et al*. 2000). Opportunistic sightings were also recorded and listed separately to actual survey results. Other data recorded included the field site number, coordinates of the location using a handheld GPS unit, location description, start and finish times, as well as the temperature, relative humidity and wind speed using a Kestrel 4000 portable weather unit.

After dark, the calls of threatened owl species were broadcast over a megaphone in an attempt to encourage a response. The subject site was also searched to locate any regurgitated owl pellets. If any pellets were found, their size, shape and content would be used in an attempt to determine the species of owl from which the pellet originated as well as the prey species the owl had been feeding on. Analysis methods followed those of Brunner *et al*. (2002) and Triggs (1996).

2.4.5 Reptiles

Type IV funnel traps were set in along both sides of two 20m runs of drift fence. Trapping lines were left for four consecutive days and nights and traps were checked daily.

During survey periods on the subject site suitable reptile habitat was inspected to detect the presence of any reptile species by way of occupancy, scats or other detectable traces. Suitable habitat included roadsides, rock outcrops and crevices, any fallen hollow logs and limbs, burrows and suitable rubbish items such as sheets of tin.

2.4.6 Habitat Hollows

Hollows are an important resource utilised by a variety of forest fauna. Vertebrate and invertebrate species use hollows as diurnal or nocturnal shelter sites, for rearing young, feeding, thermoregulation and to facilitate ranging behaviour and dispersal (Gibbons & Lindenmayer 2002). Approximately 400 Australian species potentially use hollows either on a permanent or opportunistic basis. Many threatened species are obligate users, requiring the presence of hollows to survive in the landscape (Gibbons & Lindenmayer 2002).

The areas to be cleared were inspected and any trees having potential habitat hollows were marked with a band of survey paint and their location recorded using a hand-held GPS.

3 Threatened flora

According to the Atlas of NSW Wildlife (data extracted 2 February 2010) a total of 6 threatened flora species have been recorded within a 5-kilometre radius of the subject site (**Table 1**).

Table 1: Threatened flora species recorded within a 5-kilometre radius of the subject site

Family	Scientific Name	Common Name	Status
Asteraceae	*Rutidosis heterogama*	Heath Wrinklewort	V
Elaeocarpaceae	*Tetratheca juncea*	Black-eyed Susan	V
Fabaceae (Mimosoideae)	*Acacia bynoeana*	Bynoe's Wattle	E1
Myrtaceae	*Callistemon linearifolius*	Netted Bottle Brush	V
Myrtaceae	*Eucalyptus parramattensis subsp. decadens*	Drooping Redgum	V
Proteaceae	*Grevillea parviflora subsp. parviflora*	Small-flower Grevillea	V

E = Endangered; V = Vulnerable (NSW TSC Act 1995)

Using known habitat requirements, the species from **Table 1** were assessed for their likelihood of occurrence in the powerline easement vegetation (**Table 2**).

Table 2: The likelihood of threatened flora species occurring in the powerline easement

Scientific Name	Likelihood of occurring	Impact assessed
Rutidosis heterogama	Possible	**Yes**
Tetratheca juncea	Unsuitable habitat In the locality, occurs in Smooth-barked Apple Woodland.	No
Acacia bynoeana	Unsuitable habitat In the locality occurs in Kurri Sands Swamp Woodland,	No
Callistemon linearifolius	Unsuitable habitat Normally occurs in moister habitat,	No
Eucalyptus parramattensis subsp. decadens	Unsuitable habitat In the locality occurs in Kurri Sands Swamp Woodland,	No
Grevillea parviflora subsp. parviflora	Unsuitable habitat Occurs locally in Smooth-barked Apple Woodland.	No

4 Threatened fauna

According to the Atlas of NSW Wildlife (data extracted 2 February 2010) a total of 27 threatened fauna species have been recorded within a 5-kilometre radius of the subject site (**Table 3**).

Table 3: Threatened fauna species recorded within a 5-kilometre radius of the subject site

Family	Scientific Name	Common Name	Status
Birds			
Acanthizidae	*Pyrrholaemus saggitatus*	Speckled Warbler	V
Cacatuidae	*Callocephalon fimbriatum*	Gang-gang Cockatoo	V
Climacteridae	*Climacteris picumnus*	Brown Treecreeper	V
Columbidae	*Ptilinopus magnificus*	Wompoo Fruit-Dove	V
Meliphagidae	*Melithreptus gularis gularis*	Black-chinned Honeyeater (eastern subspecies)	V
Meliphagidae	*Xanthomyza phrygia*	Regent Honeyeater	E1
Petroicidae	*Petroica boodang*	Scarlet Robin	V
Pomatostomidae	*Pomatostomus temporalis temporalis*	Grey-crowned Babbler (eastern subspecies)	V
Psittacidae	*Glossopsitta pusilla*	Little Lorikeet	V
Psittacidae	*Lathamus discolor*	Swift Parrot	E1
Psittacidae	*Neophema pulchella*	Turquoise Parrot	V
Strigidae	*Ninox connivens*	Barking Owl	V
Strigidae	*Ninox strenua*	Powerful Owl	V
Tytonidae	*Tyto novaehollandiae*	Masked Owl	V
Tytonidae	*Tyto tenebricosa*	Sooty Owl	V
Marsupials			
Dasyuridae	*Dasyurus maculatus*	Spotted-tailed Quoll	V
Petauridae	*Petaurus australis*	Yellow-bellied Glider	V
Petauridae	*Petaurus norfolcensis*	Squirrel Glider	V
Phascolarctidae	*Phascolarctos cinereus*	Koala	V
Megachiropteran Bats			
Pteropodidae	*Pteropus poliocephalus*	Grey-headed Flying-fox	V
Microchiropteran Bats			
Emballonuridae	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V
Molossidae	*Mormopterus norfolkensis*	Eastern Freetail-bat	V
Vespertilionidae	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V
Vespertilionidae	*Miniopterus australis*	Little Bentwing-bat	V
Vespertilionidae	*Miniopterus schreibersii oceanensis*	Eastern Bentwing-bat	V
Vespertilionidae	*Myotis macropus*	Southern Myotis	V
Vespertilionidae	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V
Vespertilionidae	*Vespadelus troughtoni*	Eastern Cave Bat	V

E = Endangered; V = Vulnerable (NSW TSC Act 1995)

The recorded threatened fauna were assessed as to the likelihood of their occurring in the proposed disturbance area (**Table 4**). Occurrence is considered to be either using the disturbance area as a significant part of a home range or more opportunistically as foragers with much larger home ranges or as itinerants.

Table 4: The likelihood of threatened fauna species occurring in the powerline easement

Common Name	Likelihood of occurring	Impact assessed
Birds		
Speckled Warbler	Unsuitable habitat Requires a number of fallen logs which were not present.	No
Gang-gang Cockatoo	Suitable habitat	**Yes**
Brown Treecreeper	Unsuitable habitat Requires open woodland, sparse ground cover and fallen logs.	No
Wompoo Fruit-Dove	Unsuitable habitat A bird of moist riparian habitat.	No
Black-chinned Honeyeater (eastern subspecies)	Suitable habitat	
Regent Honeyeater	Unsuitable habitat Migrates to the area and feeds on winter-flowering blossom.	No
Grey-crowned Babbler (eastern subspecies)	Unsuitable habitat	No
Little Lorikeet	Suitable habitat	**Yes**
Scarlet Robin	Suitable habitat	**Yes**
Swift Parrot	Suitable habitat	**Yes**
Turquoise Parrot	Suitable habitat	**Yes**
Barking Owl	Unsuitable habitat A bird of riparian forest	No
Powerful Owl	Suitable habitat	**Yes**
Masked Owl	Suitable habitat	**Yes**
Sooty Owl	Unsuitable habitat A bird of dense forest	No
Marsupials		
Spotted-tailed Quoll	Unsuitable habitat Requires a large home range	No
Yellow-bellied Glider	Unsuitable habitat Requires large trees with habitat hollows,	No
Squirrel Glider	Suitable habitat	**Yes**
Koala	Unsuitable habitat Requires suitable feed trees not present in the habitat.	No
Megachiropteran Bats		
Grey-headed Flying-fox	Suitable habitat	**Yes**
Microchiropteran Bats		
Yellow-bellied Sheathtail-bat	Suitable habitat	**Yes**
Eastern Freetail-bat	Suitable habitat	**Yes**
Eastern False Pipistrelle	Suitable habitat	**Yes**
Little Bentwing-bat	Suitable habitat	**Yes**
Eastern Bentwing-bat	Suitable habitat	**Yes**
Southern Myotis	Suitable habitat	**Yes**
Greater Broad-nosed Bat	Suitable habitat	**Yes**
Eastern Cave Bat	Suitable habitat	**Yes**

5 Results

5.1 Habitat description

A broad description of the habitat of each of the proposed areas:
Overhead powerline easement & infrastructure area: fully forested with Spotted Gum (*Corymbia maculata*) and Red Ironbark (*Eucalyptus fibrosa*) being the main canopy species.
Save-a-Mile: Landscaped overburden back-fill with a mix of planted Spotted Gum, wattles and exotic grasses as well as areas of spontaneous regrowth of exotic grasses and wattles.
K-cut: Landscaped overburden back-fill with spontaneous regrowth of exotic grasses and wattles.
Wattle Tree Drive: Landscaped overburden back-fill with sown exotic grasses, predominantly Rhodes Grass.
Creek-cut North: Landscaped overburden back-fill with spontaneous regrowth of exotic grasses and wattles.

The only area having potential habitat for threatened species was that of the powerline easement. The habitat in the other four areas was in poor condition and unsuitable for any of the threatened species recorded in the area.

The ecological impact assessment that follows is applied to the vegetation in and around the proposed powerline easement.

5.2 Vegetation community and flora

Lower Hunter Spotted Gum – Ironbark Forest
The overstorey was dominated by *Corymbia maculata* (Spotted Gum), *Eucalyptus fibrosa* (Red Ironbark) and *Eucalyptus umbra* (Bastard Mahogany); other overstorey species were *Eucalyptus punctata* (Grey Gum), *Syncarpia glomulifera* (Turpentine), *Angophora costata* (Smooth-barked Apple) and *Allocasuarina torulosa* (Forest Oak). The shrub layer was dominated by *Bursaria spinosa* and *Daviesia ulicifolia* and the ground layer was dominated by *Joycea pallida*, *Themeda australis* and *Entolasia stricta*.

This combination of species is consistent with that of the listed EEC (TSC Act) *Lower Hunter Spotted Gum – Ironbark Forest*.

54 species of flora were recorded across the area (Appendix 1). There were no threatened flora species present.

Coastal Plains Smooth-barked Apple Woodland

The overstorey was dominated by *Angophora costata* (Smooth-barked Apple), *Corymbia gummifera* (Red Bloodwood), *Eucalyptus umbra* (White Mahogany). There was also *Eucalyptus punctata* (Grey Gum), *Corymbia maculata* (Spotted Gum) and *Eucalyptus siderophloia* (Grey Ironbark). The shrub layer contained *Ceratopetalum gummiferum, Pultenaea villosa, Gompholobium latifolium Glochidion ferdinandi* and *Xylomelum pyriforme*. The ground cover was dominated by *Entolasia stricta, Themeda australis* and *Imperata cylindrica.*

68 species of flora were recorded in this community (Appendix 1). There were no threatened flora species present.

5.3 Fauna

Overall, 2 amphibian, 7 reptile, 12 mammal and 45 bird species were recorded in the area. Of these, six threatened fauna species were recorded (**Table 5**).

Table 5: Threatened fauna species recorded on the subject site

Scientific Name	Common Name	Method	Habitat	Legal Status
Ninox strenua	Powerful Owl	Call Playback	Open forest	V
Saccolaimus flaviventris	Yellow-bellied Sheathtail Bat	Anabat	Open forest	V
Mormopterus norfolkensis	East Coast Freetail Bat	Anabat	Open forest	V
Miniopterus australis	Little Bent-wing Bat	Anabat	Open forest	V
Miniopterus schreibersii	Large Bent-wing Bat	Anabat	Open forest	V
Scoteanax rueppellii	Greater Broad-nosed Bat	Anabat	Open forest	V

5.3.1 SEPP 44

SEPP 44 requires that for proposals on properties involving 1 hectare or more, the habitat should be evaluated for potential Koala habitat and core Koala Habitat. Potential Koala habitat is defined as *'areas of native vegetation where the trees listed in Schedule 2 (of SEPP 44) 'constitute at least 15% of the total number of trees in the upper and lower strata of the tree component'*. Should potential Koala habitat be found, further investigation of the existence of core Koala habitat should be undertaken and if this habitat is found to be present then a detailed Plan of Management should be prepared for the Koala colony in the area. A list of Schedule 2 feed trees is provided in **Table 6** below.

Table 6: SEPP 44, Schedule 2 - Koala Feed Tree Species

Scientific Name	***Common Name***
Eucalyptus tereticornis	Forest Red Gum
Eucalyptus microcorys	Tallowwood
Eucalyptus punctata	Grey Gum
Eucalyptus viminalis	Ribbon or Manna Gum
Eucalyptus camaldulensis	River Red Gum
Eucalyptus haemastoma	Broad-leaved Scribbly Gum
Eucalyptus signata	Scribbly Gum
Eucalyptus albens	White Box
Eucalyptus populnea	Bimble Box or Poplar Box
Eucalyptus robusta	Swamp Mahogany

Of the feed trees listed in Table 7, only *Eucalyptus punctata* was present and at less than 15% of the total number of trees. This meant that potential Koala habitat was not present and that further investigation was not required.

5.3.2 Habitat trees

In the areas to be cleared, 31 trees having potential fauna habitat hollows were found (Figure 3). One tree of particular note was a tall Spotted Gum (*Corymbia maculata)* which contained a large raptor nest. This tree was located just outside of the powerline clearing area and care should be taken during clearing not to disturb this tree, such as by pushing other trees against it.

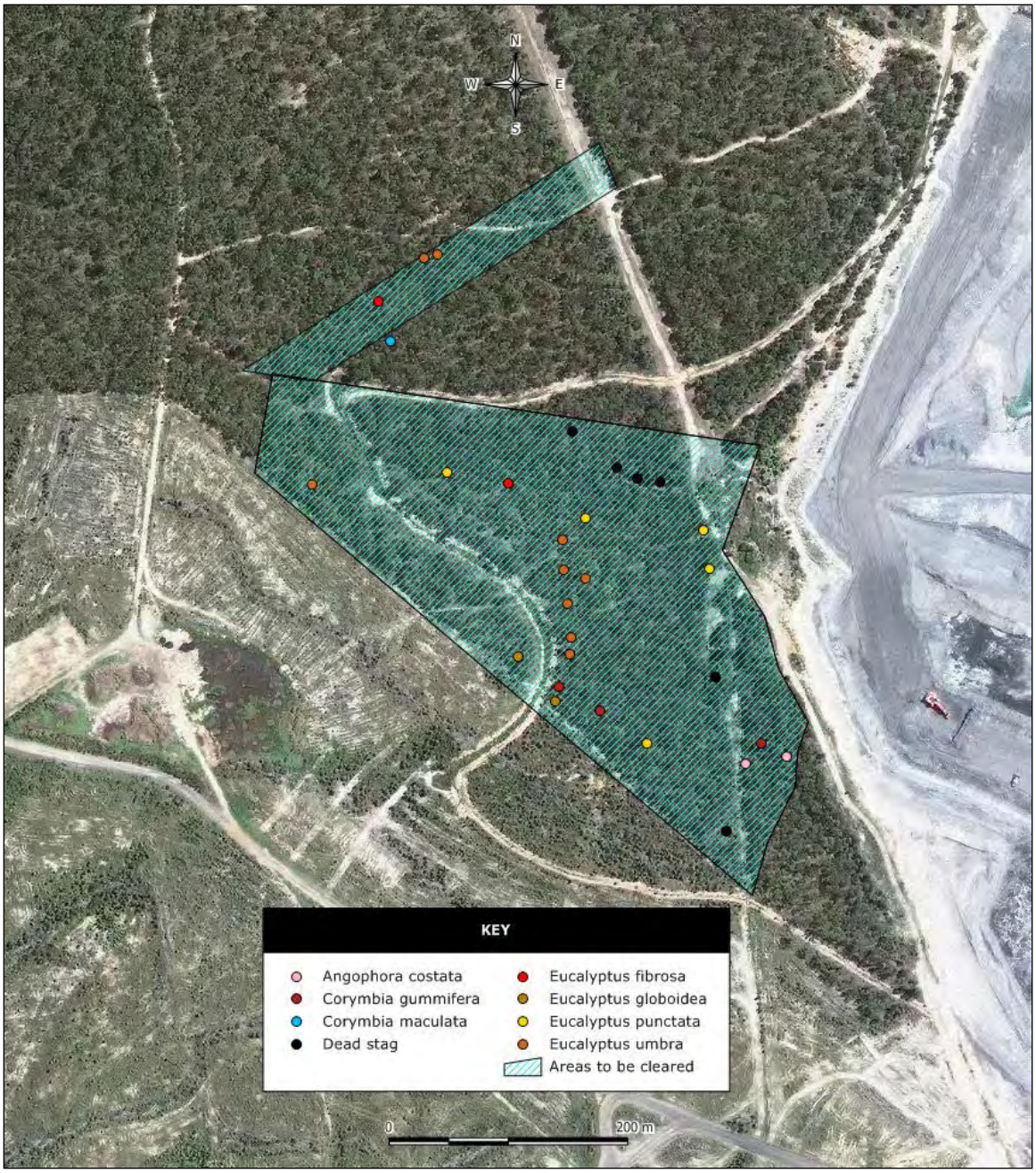

Figure 3: The location and species of habitat trees recorded in the areas to be cleared

The clearing would be at the edge of the open cut working areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Little Lorikeet

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

Three trees having potential breeding hollows would be lost but this would not have an impact on the life cycle of the species..

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The loss of canopy trees would reduce the amount of available foraging habitat for the species. However the loss of about 1 hectare would be insignificant in the overall context of available habitat in the locality.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

The Little Lorikeet is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Swift Parrot

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The habitat at the forest/cleared interface is marginal for these birds with little grassland foraging available and none of these birds were recorded during the investigation. The small amount of clearing required would not have any impact on the life cycle of these birds were they present at the subject site.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal would not affect the potential habitat for this bird.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

The Swift Parrot is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Gang-gang Cockatoo

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The small amount of clearing required would have no impact on the life-cycle of the Gang-gang Cockatoo. The loss of three trees having potential breeding hollows would not have a detrimental impact on the life-cycle of the species.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal would not affect the potential habitat for this bird.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

The Gang-gang Cockatoo is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Powerful Owl

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The Powerful Owl home range is around 1000 ha. The small amount of vegetation that is proposed to be cleared does not contain essential habitat features for this bird i.e. there were no trees with suitable breeding hollows and no vegetation suitable for daytime roosting.

b) *How is the proposal likely to affect the habitat of a threatened species, population or* ecological community?

The proposal would not affect the potential habitat for this bird.

c) *Does the proposal affect any threatened species or populations that are at the limit of its* known distribution?

The Powerful Owl is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Masked Owl

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The Masked Owl home range is around 750 ha. Three trees having possible breeding hollows would be lost however no Masked Owls were recorded in the area.

b) *How is the proposal likely to affect the habitat of a threatened species, population or* ecological community?

The proposal would not affect the potential habitat for this bird.

c) *Does the proposal affect any threatened species or populations that are at the limit of its* known distribution?

The Powerful Owl is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

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f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Black-chinned Honeyeater (eastern subspecies)

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The species can be found foraging and breeding in habitat similar to that present. The loss of 1 hectare would not place any local population at risk.

b) *How is the proposal likely to affect the habitat of a threatened species, population or* ecological community?

The proposal would not affect the potential habitat for this bird.

c) *Does the proposal affect any threatened species or populations that are at the limit of its* known distribution?

The species is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Scarlet Robin

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The species can be found foraging and breeding in habitat similar to that present. The loss of 1 hectare would not place any local population at risk.

b) *How is the proposal likely to affect the habitat of a threatened species, population or* ecological community?

The proposal would not affect the potential habitat for this bird.

c) *Does the proposal affect any threatened species or populations that are at the limit of its* known distribution?

The species is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Squirrel Glider

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

No Squirrel Gliders were recorded during the field work although they are known to be in the area having been recorded elsewhere on Bloomfield as well as on Donaldson to the east. The proposed clearing would not place any local population of Squirrel Gliders under threat. Three trees having potential denning hollows would be lost, however no Squirrel Gliders were recorded in the area.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal would not affect the potential habitat for this glider.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

The Squirrel Glider is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Grey-headed Flying Fox

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

There were no breeding colonies of this flying fox present and the small amount of vegetation proposed to be cleared would not impact on the overall available foraging resources of the species.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal would not affect the potential habitat for this flying fox.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

The Grey-headed Flying Fox is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Cave Roosting *Microchiropteran* Bats

Little Bent-wing Bat
Eastern Bent-wing Bat
Eastern Cave Bat

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The proposed action would not remove foraging habitat from the home ranges of these species. No breeding habitat was present in the area.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal would not affect the potential habitat for these bats.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

Neither species of bat are at the known limit of their distributions at this location.

d) How is the proposal likely to affect current disturbance regimes?

Very little change to current disturbance regimes as the habitat is on the edge of a cleared mining area.

e) How is the proposal likely to affect habitat connectivity?

6 Impact assessment

This section examines the possible impact of the proposed powerline easement construction on threatened species and endangered communities. An impact assessment is conducted according to the Draft Guidelines for Threatened Species Assessment (DECC & DPI 2005). A review of the threatened species profiles shows that there were threatened species that could be found on the subject site under different conditions to those prevailing at the time of this investigation or could be found in similar habitat in the immediate region. An impact assessment was applied to these species, threatened flora and fauna species and any endangered ecological communities that were recorded during the field surveys.

6.1 Flora

Rutidosis heterogama

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

No *Rutidosis heterogama* was found in or near the area to be cleared.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The clearing of approximately 8 hectare would have no impact on the availability of suitable habitat for the species.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

Rutidosis heterogama would not be at the limit of its known distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be no additional risks to the surrounding habitat as a result of the establishment of the powerline easement.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat was present.

6.2 Fauna

Turquoise Parrot

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The habitat at the forest/cleared interface is marginal for these birds with little grassland foraging available and none of these birds were recorded during the investigation. The small amount of clearing required would not have any impact on the life cycle of these birds were they present at the subject site. It may in fact create a small amount of suitable habitat for the species.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The new powerline easement could make more suitable habitat available for these birds by creating additional forest/grassland interface.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

The Turquoise Parrot is not at the known limit of its distribution at this location.

d) How is the proposal likely to affect current disturbance regimes?

There would be very little change to current disturbance regimes as the habitat is located at the edge of the existing work areas.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

Tree Roosting *Microchiropteran* Bats

Eastern Freetail-bat
Yellow-bellied Sheathtail Bat
Greater Broad-nosed Bat
Eastern False Pipistrelle
Southern Myotis

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

The small area of clearing involved in the proposed development would not impact on the life cycle of these species and would not restrict their foraging.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposal would not affect the potential habitat for these bats.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

None of the species of bat are at the known limit of their distributions at this location.

d) How is the proposal likely to affect current disturbance regimes?

Very little change to current disturbance regimes as the habitat is on the edge of a cleared mining area.

e) How is the proposal likely to affect habitat connectivity?

The clearing would be at the edge of the open cut working a areas and would not result in a loss of connectivity between habitat patches.

f) How is the proposal likely to affect critical habitat?

No critical habitat for this species occurs at this location.

6.3 Endangered Ecological Community

Lower Hunter Spotted Gum – Ironbark Forest

Figure 4 shows the mapped vegetation for the clearing required for the powerline easement and infrastructure areas. A total of about 8 hectares of the EEC would be cleared.

a) How is the proposal likely to affect the lifecycle of a threatened species and/or population?

Not applicable.

b) How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

The proposed mining will result in the loss of about 8 hectares of this community. However there is about 145 ha of this community in the immediate vicinity of the proposed disturbance area and the loss of 8 hectares would not have a significant impact on the remaining community. This of course has been demonstrated by the fact that historical clearing around remnants of this EEC has not impacted negatively on those remnants.

c) Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

Not applicable.

d) How is the proposal likely to affect current disturbance regimes?

Very little change to current disturbance regimes as the habitat is on the edge of a cleared mining area.

e) How is the proposal likely to affect critical habitat?

Figure 4 Vegetation map for the powerline easement and infrastructure areas to be cleared

6.5 Commonwealth considerations

Matters of national significance protected under the EPBC Act 1999 are as follows:

- World Heritage properties
- National heritage places
- Wetlands of international importance (Ramsar wetlands)
- Threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- Nuclear actions (including uranium mining)

None of these matters would be involved in the proposed extension to activities. In particular there were: no wetlands; no migratory species; and, none of the Commonwealth listed threatened species or ecological communities were present.

7 Conclusion & recommendations

The treatment of the habitat trees in the powerline easement is the only recommendation. In the week prior to clearing, these trees should be inspected at dusk to determine whether any of the hollows are occupied. If there is a colony of microbats or a threatened owl using the hollows then clearing should be timed to minimise any impact. When clearing is finally carried out these trees should be left standing for at least 5 nights so that any occupants can relocate. When these trees are finally brought down an experienced fauna ecologist should be present to attend to any fauna that are still occupying the hollows.

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Appendix 1 - Flora species recorded on the subject site

MU17 Lower Hunter Spotted Gum – Ironbark Forest

Common Name	Scientific Name	Family Name
Pastel Flower	*Pseuderanthemum variabile*	**Acanthaceae**
Mulga Fern	*Cheilanthes sieberi*	**Adiantaceae**
	Tricoryne elatior	**Anthericaceae**
	Chrysocephalum semipapposum	**Asteraceae**
	Lagenifera stipitata	**Asteraceae**
	Ozothamnus diosmifolius	**Asteraceae**
Fuzzweed	*Vittadinia cuneata*	**Asteraceae**
Wonga Vine	*Pandorea pandorana subsp. pandorana*	**Bignoniaceae**
Forest Oak	*Allocasuarina torulosa*	**Casuarinaceae**
	Lepidosperma laterale	**Cyperaceae**
	Ptilothrix deusta	**Cyperaceae**
	Hibbertia empetrifolia subsp. empetrifolia	**Dilleniaceae**
	Leucopogon juniperinus	**Epacridaceae**
Coffee Bush	*Breynia oblongifolia*	**Euphorbiaceae**
	Phyllanthus hirtellus	**Euphorbiaceae**
	Daviesia squarrosa	**Fabaceae (Faboideae)**
Gorse Bitter Pea	*Daviesia ulicifolia*	**Fabaceae (Faboideae)**
	Dillwynia retorta	**Fabaceae (Faboideae)**
	Glycine clandestina	**Fabaceae (Faboideae)**
	Glycine microphylla	**Fabaceae (Faboideae)**
False Sarsaparilla	*Hardenbergia violacea*	**Fabaceae (Faboideae)**
	Acacia elongata	**Fabaceae (Mimosoideae)**
	Acacia falcata	**Fabaceae (Mimosoideae)**
	Acacia parvipinnula	**Fabaceae (Mimosoideae)**
	Goodenia rotundifolia	**Goodeniaceae**
	Gonocarpus teucrioides	**Haloragaceae**
Whiteroot	*Pratia purpurascens*	**Lobeliaceae**
	Lomandra filiformis subsp. coriacea	**Lomandraceae**
Spotted Gum	*Corymbia maculata*	**Myrtaceae**
Red Ironbark	*Eucalyptus fibrosa*	**Myrtaceae**
White Mahogany	*Eucalyptus umbra*	**Myrtaceae**
	Dianella longifolia var. longifolia	**Phormiaceae**
	Dianella tasmanica	**Phormiaceae**
Apple Dumplings	*Billardiera scandens var. scandens*	**Pittosporaceae**
	Bursaria spinosa var. spinosa	**Pittosporaceae**
	Anisopogon avenaceus	**Poaceae**
Threeawn Speargrass	*Aristida vagans*	**Poaceae**
	Aristida warburgii	**Poaceae**
Wallaby Grass	*Austrodanthonia fulva*	**Poaceae**
	Dichelachne sieberiana	**Poaceae**
	Digitaria ramularis	**Poaceae**

Hedgehog Grass	*Echinopogon ovatus*	**Poaceae**
Wiry Panic	*Entolasia stricta*	**Poaceae**
	Eragrostis brownii	**Poaceae**
	Microlaena stipoides var. stipoides	**Poaceae**
	Panicum simile	**Poaceae**
	Paspalidium distans	**Poaceae**
Kangaroo Grass	*Themeda australis*	**Poaceae**
Narrow-leaved Geebung	*Persoonia linearis*	**Proteaceae**
	Boronia polygalifolia	**Rutaceae**
	Dodonaea triquetra	**Sapindaceae**
	Hybanthus stellarioides	**Violaceae**
Grass Tree	*Xanthorrhoea latifolia subsp. latifolia*	**Xanthorrhoeaceae**
	Macrozamia reducta	**Zamiaceae**

MU30 Coastal Plains Smooth-barked Apple Woodland

Common Name	Scientific Name	Family Name
Pastel Flower	*Pseuderanthemum variabile*	**Acanthaceae**
Maiden Hair Fern	*Adiantum aethiopicum*	**Adiantaceae**
Mulga Fern	*Cheilanthes sieberi*	**Adiantaceae**
	Tricoryne elatior	**Anthericaceae**
	Astrotricha obovata	**Araliaceae**
Elderberry Ash	*Polyscias sambucifolia*	**Araliaceae**
Wonga Vine	*Pandorea pandorana subsp. pandorana*	**Bignoniaceae**
Forest Oak	*Allocasuarina torulosa*	**Casuarinaceae**
Orange Bark	*Maytenus silvestris*	**Celastraceae**
	Ceratopetalum gummiferum	**Cunoniaceae**
Swordgrass	*Gahnia clarkei*	**Cyperaceae**
	Lepidosperma concavum	**Cyperaceae**
	Lepidosperma laterale	**Cyperaceae**
	Hypolepis muelleri	**Dennstaedtiaceae**
Bracken Fern	*Pteridium esculentum*	**Dennstaedtiaceae**
	Hibbertia empetrifolia subsp. empetrifolia	**Dilleniaceae**
Cheese Tree	*Glochidion ferdinandi*	**Euphorbiaceae**
	Phyllanthus hirtellus	**Euphorbiaceae**
Gorse Bitter Pea	*Daviesia ulicifolia*	**Fabaceae (Faboideae)**
	Dillwynia retorta	**Fabaceae (Faboideae)**
	Glycine clandestina	**Fabaceae (Faboideae)**
	Gompholobium latifolium	**Fabaceae (Faboideae)**
	Hovea linearis	**Fabaceae (Faboideae)**
	Pultenaea villosa	**Fabaceae (Faboideae)**
	Acacia elongata	**Fabaceae (Mimosoideae)**
	Acacia linifolia	**Fabaceae (Mimosoideae)**
	Gonocarpus teucrioides	**Haloragaceae**
Lacy Wedge Fern	*Lindsaea microphylla*	**Lindsaeaceae**
Whiteroot	*Pratia purpurascens*	**Lobeliaceae**
Whiteroot	*Pratia purpurascens*	**Lobeliaceae**
	Lomandra filiformis subsp. coriacea	**Lomandraceae**
	Lomandra multiflora subsp. multiflora	**Lomandraceae**
Fishbone	*Lomandra obliqua*	**Lomandraceae**
Muttonwood	*Rapanea variabilis*	**Myrsinaceae**
Smooth-barked Apple	*Angophora costata*	**Myrtaceae**
Red Bloodwood	*Corymbia gummifera*	**Myrtaceae**
Spotted Gum	*Corymbia maculata*	**Myrtaceae**
Red Ironbark	*Eucalyptus fibrosa*	**Myrtaceae**
	Eucalyptus globoidea	**Myrtaceae**
	Eucalyptus punctata	**Myrtaceae**
	Eucalyptus siderophloia	**Myrtaceae**
White Mahogany	*Eucalyptus umbra*	**Myrtaceae**
	Leptospermum polygalifolium subsp. polygalifolium	**Myrtaceae**
	Leptospermum trinervium	**Myrtaceae**
Native Olive	*Notelaea longifolia*	**Oleaceae**

	Dianella caerulea var. caerulea	**Phormiaceae**
	Dianella longifolia var. longifolia	**Phormiaceae**
	Dianella tasmanica	**Phormiaceae**
Apple Dumplings	*Billardiera scandens var. scandens*	**Pittosporaceae**
Hairy Pittosporum	*Pittosporum revolutum*	**Pittosporaceae**
	Anisopogon avenaceus	**Poaceae**
Threeawn Speargrass	*Aristida vagans*	**Poaceae**
Wallaby Grass	*Austrodanthonia fulva*	**Poaceae**
	Cymbopogon refractus	**Poaceae**
Hedgehog Grass	*Echinopogon caespitosus var. caespitosus*	**Poaceae**
Wiry Panic	*Entolasia stricta*	**Poaceae**
Bladey Grass	*Imperata cylindrica var. major*	**Poaceae**
	Joycea pallida	**Poaceae**
	Microlaena stipoides var. stipoides	**Poaceae**
Kangaroo Grass	*Themeda australis*	**Poaceae**
	Banksia spinulosa var. collina	**Proteaceae**
	Lomatia silaifolia	**Proteaceae**
Narrow-leaved Geebung	*Persoonia linearis*	**Proteaceae**
Woody Pear	*Xylomelum pyriforme*	**Proteaceae**
	Ripogonum album	**Ripogonaceae**
	Pomax umbellata	**Rubiaceae**
	Pimelea linifolia subsp. linifolia	**Thymelaeaceae**
	Macrozamia reducta	**Zamiaceae**

Appendix 2 - Fauna species in the immediate vicinity if the proposed powerline easement

Scientific Name	Common Name
Amphibians	
Litoria latopalmata	Broad-palmed Frog
Pseudophryne coriacea	Red-back Toadlet
Reptiles	
Amphibolurus muricatus	Jacky Lizard
Carlia tetradactyla	Southern Rainbow Skink
Diplodactylus vittatus	Eastern Stone Gecko
Furina diadema	Red-naped Snake
Oedura lesueurii	Lesueur's Velvet Gecko
Ramphotyphlops nigrescens	Blackish Blind Snake
Saiphos equalis	Three-toed Skink
Mammals	
Antechinus stuartii	Brown Antechinus
Macropus giganteus	Eastern Grey Kangaroo
*Oryctolagus cuniculus**	Rabbit
Perameles nasuta	Long-nosed Bandicoot
Trichosurus vulpecula	Brushtail Possum
Bats	
Chalinolobus gouldii	Gould's Wattled Bat
Chalinolobus morio	Chocolate Wattled Bat
Miniopterus australis[#]	Little Bent-wing Bat
Miniopterus schreibersii[#]	Large Bent-wing Bat
Mormopterus norfolkensis[#]	East Coast Freetail Bat
Mormopterus planiceps	Southern Freetail Bat
Nyctophilus geoffroyi	Lesser Long-eared Bat
Rhinolopus megaphyllus	Eastern Horseshoe Bat
Saccolaimus flaviventris[#]	Yellow-bellied Sheathtail Bat
Scoteanax rueppellii[#]	Greater Broad-nosed Bat
Scotorepens balstoni	Inland Broad-nose Bat
Scotorepens orion	Eastern Broad-nose Bat
Tadarida australis	White-striped Mastiff Bat
Vespadelus vulturnus	Little Forest Bat
Birds	
Acanthiza lineata	Striated Thornbill
Acanthiza nana	Yellow Thornbill
Acanthorhynchus tenuirostris	Eastern Spinebill
Alisterus scapularis	Australian King-Parrot
Cacatua galerita	Sulphur-crested Cockatoo
Cacomantis flabelliformis	Fan-tailed Cuckoo

Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo
Chrysococcyx basalis	Horsfield's Bronze-Cuckoo
Chrysococcyx lucidus	Shining Bronze-Cuckoo
Colluricincla harmonica	Grey Shrike-thrush
Coracina novaehollandiae	Black-faced Cuckoo-shrike
Coracina tenuirostris	Cicadabird
Cormobates leucophaeus	White-throated Treecreeper
Corvus coronoides	Australian Raven
Coturnix ypsilophora	Brown Quail
Cracticus nigrogularis	Pied Butcherbird
Dacelo novaeguineae	Laughing Kookaburra
Eopsaltria australis	Eastern Yellow Robin
Geopelia humeralis	Bar-shouldered Dove
Gerygone olivacea	White-throated Gerygone
Gymnorhina tibicen	Australian Magpie
Hirundo neoxena	Welcome Swallow
Lichenostomus chrysops	Yellow-faced Honeyeater
Lichenostomus melanops	Yellow-tufted Honeyeater
Malurus cyaneus	Superb Fairy-wren
Malurus lamberti	Variegated Fairy-wren
Myiagra rubecula	Leaden Flycatcher
Neochmia temporalis	Red-browed Finch
Ninox strenua[#]	Powerful Owl
Nycticorax caledonicus	Nankeen Night Heron
Ocyphaps lophotes	Crested Pigeon
Oriolus sagittatus	Olive-backed Oriole
Pachycephala rufiventris	Rufous Whistler
Pardalotus punctatus	Spotted Pardalote
Pardalotus striatus	Striated Pardalote
Philemon corniculatus	Noisy Friarbird
Platycercus elegans	Crimson Rosella
Platycercus eximius	Eastern Rosella
Podargus strigoides	Tawny Frogmouth
Rhipidura fuliginosa	Grey Fantail
Scythrops novaehollandiae	Channel-billed Cuckoo
Sericornis frontalis	White-browed Scrubwren
Strepera graculina	Pied Currawong
Taeniopygia bichenovii	Double-barred Finch
Todiramphus sanctus	Sacred Kingfisher
Zosterops lateralis	Silvereye

*Introduced, [#]Vulnerable (TSC Act)

Appendix 3 – Habitat images

Powerline easement/infrastructure area Lower Hunter Spotted Gum – Ironbark Forest

K-cut

No critical habitat was present.

f) How is the proposal likely to affect habitat connectivity?

The areas to be cleared are at the edge of larger areas of remnant forest and their clearing will not break any habitat connectivity.

6.4 Key threatening processes

The following listed threatening processes could be in action as a result of the proposed works being carried out:

- *Clearing of native vegetation*

Approximately 10 ha of native vegetation would be cleared.

- *High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition*

Bloomfield Colliery has a fire management plan in place to control the frequency of fire

- *Invasion and establishment of exotic vines and scramblers*

Can be monitored and controlled through a weed management plan

- *Invasion of native plant communities by exotic perennial grasses*

Can be monitored and controlled through a weed management plan

- *Invasion, establishment and spread of* Lantana camara

Can be monitored and controlled through a weed management plan

- *Loss of Hollow-bearing Trees*

31 hollow bearing trees would be removed

- *Removal of dead wood and dead trees*

This KTP relates particularly to the removal of dead material from standing forest rather than the loss associated with the clearing of native vegetation

Save-a-mile

Save-a-mile

Creek Cut North

Wattle Tree Drive (the open grassed area)

Appendix C – Air Quality Assessment

31 May 2010

Steve Dunn
Bloomfield Colliery
Via email: sdunn@bloomcoll.com.au

Dear Steve

Re: Bloomfield Modification Analysis for Air Quality

We have completed the modelling for the proposed additional overburden emplacement area and modification of the two rehabilitation areas for Stage 2. The additional emplacement area will facilitate the storage of 1,200,000 bcm of overburden at the "Save a mile south" emplacement area as shown in **Figure 1**. The modification of the rehabilitation areas, also shown in **Figure 1**, will involve the reshaping of the final landform to improve drainage along with the addition of 50,000 bcm and 100,000 bcm of overburden to the northern and southern rehabilitation areas, respectively.

Also proposed are the relocation of the southern end of the powerline that provides electricity to the site along with a 40 m wide easement. The construction of these works is anticipated to take less than 6 weeks and is to be built during Stage 2. In addition, it is proposed to develop a northern haul road known as "Wattle Tree Drive" along the alignment of an existing access road. The location of Wattle Tree Drive is shown in **Figure 1.** The implementation of the new haul route would result in a decreased haul distance for the ROM coal transported from Creek Cut to the washery for processing. While dust would be generated from the earthworks associated with the proposed relocation of the powerline and construction of Wattle Creek Drive, there are a number of safe guards that can be put in place during these type of operations to ensure there is no detrimental impact on the local air quality. Therefore the impacts have not been specifically modelled.

The modelling of emissions from Bloomfield is based on the emissions estimation tables, as agreed on 11 January 2010. Copies of the emissions tables are provided in **Table 1** for reference.

For the cumulative assessment, emissions from the Donaldson Open-Cut and Abel Underground coal mines, located to the east of Bloomfield, have been included in the assessment. Bloomfield, Donaldson and Abel make use of a common Coal Handling and Processing Plant (CHPP) and also operate stockpiles in the same area and share the same rail loop. These activities were approved as part of the Abel Underground Mine Project (**Holmes Air Sciences, 2006**). Emissions from these common facilities have only been included in the cumulative assessment.

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BRISBANE

GOLD COAST

TOOWOOMBA

A PEL COMPANY

Queensland Environment Pty Ltd
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It was assumed that annual average concentrations due to emissions from distant mines and other sources, including the shared CHPP are:

- PM_{10} – 9.6 µg/m^3
- TSP – 24.5 µg/m^3
- Dust deposition – 0.5 g/m^2/month

These data are consistent with values used in recent assessments (**Holmes Air Sciences, 2008**).

Meteorological data

A meteorological station has been operated since 1999 as part of the Donaldson Project environmental monitoring program. **Figure 2** shows the windroses for this site. The weather station is located on the Donaldson mine site, to the east of Bloomfield mine, but is unavoidably affected by trees. Therefore, the weather station's exposure does not comply with Australian Standard 2923-1987, which specifies the requirements for the exposure of weather stations used to collect wind speed and wind direction data for modelling. For this reason, the modelling work has been undertaken using data from the nearby DECCW meteorological station at Beresfield located 8 km to the east. **Figure 3** presents the windroses compiled for the 2004 and 2005 dataset at Beresfield. Meteorological information was available from the 1st of August 2004 to 31st July 2005 with 92% data retrieval.

The two sites show a similar distribution of winds, but the Donaldson site shows a much higher frequency of light winds. This is not unexpected given the shielding effect of the vegetation on the mine site.

Results

The results of the modelling are presented as contour plots in **Figure 4** to **Figure 7** for Bloomfield Colliery alone and **Figure 8** to **Figure 10** for the cumulative impact assessment. A summary of these results for each residence has been provided in **Table 2**.

The figures indicate the potential area of impact for 24-hour average PM_{10}, annual average PM_{10}, TSP and dust deposition, as a result of the proposed modifications to Bloomfield Colliery shown in **Figure 1**.

The modelling results indicate that there are no predicted exceedances of the DECCW criterion due to the modifications of Bloomfield Colliery at any of the residences.

Concluding comments

The assumptions included in the dispersion modelling which would influence the predicted impacts include:

- Quantity of overburden and coal removed.
- Length and location of haul roads.
- Level of dust control on haul roads (assumed to be 75% through the application of water).
- Size of exposed areas that would be impacted by wind erosion i.e. any increase in rehabilitated areas would be beneficial and tend to reduce the impacts.
- Meteorological data used – the data used are considered to be reliable, representative data.
- Assumptions related to activities at nearby mines e.g. any operations at Donaldson and Abel mines would increase the cumulative impacts.

- Assumptions related to "background" concentrations. Whilst the approach generally taken is to review ambient air quality monitoring data and professional judgement, a more representative "background", could be determined by modelling detailed mining activities for 2008 and comparing the predicted impacts with contemporaneous monitoring data. There are still limitations to this approach as it will not be possible to accurately model the activities at the nearby mines.

Please feel free to contact me on 02 9874 8644 if you would like any clarification or if I can assist in any way.

Yours sincerely

Justine Beaney
PAEHolmes

References

Holmes Air Sciences (2006). *Air Quality Assessment Abel Underground Coalmine.* Suite 2B, 14 Glen Street, Eastwood NSW 2122: Holmes Air Sciences.

Holmes Air Sciences (2008). *Air Quality Assessment Bloomfield Mine.* Suite 2B, 14 Glen Street, Eastwood NSW 2122: Holmes Air Sciences.

Table 1: Stage 2 – Bloomfield Modifications Emissions Data

ACTIVITY	TSP	Intensity	units	Emission	units	Variable 1	units	Variable 2	units	Variable 3	units
OB - Stripping topsoil - Creek cut	280	20	h/y	14.0	kg/h						
OB - Stripping topsoil - S cut	266	19	h/y	14.0	kg/h						
OB - Stripping topsoil - Save a mile south	14	1	h/y	14.0	kg/h						
OB - Drilling - Creek cut	10,386	17,604	holes/y	0.59	kg/hole						
OB - Drilling - S cut	9,588	16,250	holes/y	0.59	kg/hole						
OB - Blasting - Creek cut	7,872	115	blasts/y	68	kg/blast	4590	Area of blast in square metres				
OB - Blasting - S cut	7,266	106	blasts/y	68	kg/blast	4590	Area of blast in square metres				
OB - Sh/Ex/FELs loading - Creek cut	44,157	10,140,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
OB - Sh/Ex/FELs loading - S cut	40,760	9,360,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
OB - Hauling to emplacement - from Creek cut	67,532	8,520,000	t/y	0.00793	kg/t	190	t/truck load	1.506	km/return trip	1.0	kg/VKT
OB - Hauling to emplacement - from S cut	95,495	8,100,000	t/y	0.01179	kg/t	190	t/truck load	2.24	km/return trip	1.0	kg/VKT
OB - Hauling to save a mile south emplacement - from Creek	27,966	1,440,000	t/y	0.01942	kg/t	190	t/truck load	3.69	km/return trip	1.0	kg/VKT
OB - Hauling to save a mile south emplacement - from S cut	32,938	1,440,000	t/y	0.02287	kg/t	190	t/truck load	4.35	km/return trip	1.0	kg/VKT
OB - Emplacing at dumps - Creek cut	37,102	8,520,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
OB - Emplacing at dumps - S cut	35,273	8,100,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
OB - Emplacing at save a mile south dumps - Creek cut	6,271	1,440,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
OB - Emplacing at save a mile south dumps - S cut	6,271	1,440,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
OB - Dozers on O/B - Creek cut	61,316	1,488	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on O/B - S cut	66,797	1,621	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on O/B - Save a mile south	4,203	102	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on Rehabilitation - Creek cut	30,902	750	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on Rehabilitation - S cut	28,375	689	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
OB - Dozers on Rehabilitation - Save a mile south	4,664	113	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
CL - Dozers ripping - Creek cut	36,106	1,024	h/y	35.3	kg/h	5	silt content in %	4	moisture content in %		
CL - Dozers ripping - S cut	33,329	945	h/y	35.3	kg/h	5	silt content in %	4	moisture content in %		
CL - Loading ROM to trucks -Creek cut	56,834	676,000	t/y	0.08407	kg/t	5	moisture content of coal in %				
CL - Loading ROM to trucks - South Pit	52,462	624,000	t/y	0.08407	kg/t	5	moisture content of coal in %				
CL - Hauling ROM coal to dump hopper - Creek cut - wattle	78,213	676,000	t/y	0.11570	kg/t	40	t/load	4.628	km/return trip	1.0	kg/VKT
CL - Hauling ROM coal to dump hopper - S cut	115,970	624,000	t/y	0.18585	kg/t	40	t/load	7.434	km/return trip	1.0	kg/VKT
RE - Hauling OB to northern rehab	10,956	120,000	t/y	0.09130	kg/t	40	t/load	3.652	km/return trip	1.0	kg/VKT
RE - Hauling OB to southern rehab	29,964	240,000	t/y	0.12485	kg/t	40	t/load	4.994	km/return trip	1.0	kg/VKT
RE - unloading OB at northern rehab	523	120,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
RE - unloading OB at southern rehab	1,045	240,000	t/y	0.00435	kg/t	1.3937	average of (wind speed/2.2)^1.3 in m/s	1	moisture content in %		
RE - Dozers at northern rehab	777	19	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
RE - Dozers at southern rehab	389	9	h/y	41.2	kg/h	10	silt content in %	1	moisture content in %		
WE - OB spoil area - Creek cut	16,983	5	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - OB spoil area - S cut	161,586	46	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - Open pit - Creek cut	38,212	11	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - Open pit - S cut	95,176	27	ha	3538.1	kg/ha/y	84	Average number of raindays	10	silt content in %	9.6	% of winds above 5.4 m/s
WE - ROM stockpiles	-	0	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - Product stockpiles	-	0	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - OB Save a mile south	24,961	14	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - Northern rehab area	18,017	10	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
WE - Southern rehab area	12,784	7	ha	1769.1	kg/ha/y	84	Average number of raindays	5	silt content in %	9.6	% of winds above 5.4 m/s
Grading roads	13,516	21,960	km	0.61547	kg/VKT	8	speed of graders in km/h				
Donaldson and Abel wi	61813										
Donaldson and Abel ws	11400										
Donaldson and Abel we	11231										
Donaldson and Abel - Dumping ROM	13140										
Donaldson and Abel - Hauling to CHPP	148000										
Donaldson and Abel -Handling coal at CHPP	117000										
Donaldson and Abel - loading coal to stockpile	2250										
Donaldson and Abel - Loading coal to trains/trucks	2250										
Total	**1,423,499**										

Table 2: Predicted PM_{10} concentrations at discrete receptors (µg/m³)

			Project alone				Project and other sources		
			PM_{10} (µg/m³)		TSP (µg/m³)	Dust Deposition (g/m²/month)	PM_{10} (µg/m³)	TSP (µg/m³)	Dust Deposition (g/m²/month)
Averaging Period			24-hour	Annual	Annual	Annual	Annual	Annual	Annual
Map Grid Australia Coordinates (Zone 56)		ID	*Impact Assessment Criteria*						
X (m)	Y (m)		*50*	*30*	*90*	*2*	*30*	*90*	*4*
366938	6366795	E	21	3	4	0.4	13	29	0.9
367471	6367197	F	23	4	5	0.6	21	46	1.1
362820	6368716	G	11	2	2	0.1	11	27	0.6
364843	6371713	H	29	5	5	0.2	15	30	0.7
369556	6372623	I	10	1	1	0.0	11	26	0.5
370119	6366617	K	8	1	2	0.2	13	28	0.8
367414	6372389	L	17	2	2	0.0	12	28	0.6
366319	6367539	M	32	6	7	0.9	16	33	1.4
365080	6367704	N	33	4	5	0.4	14	30	0.9

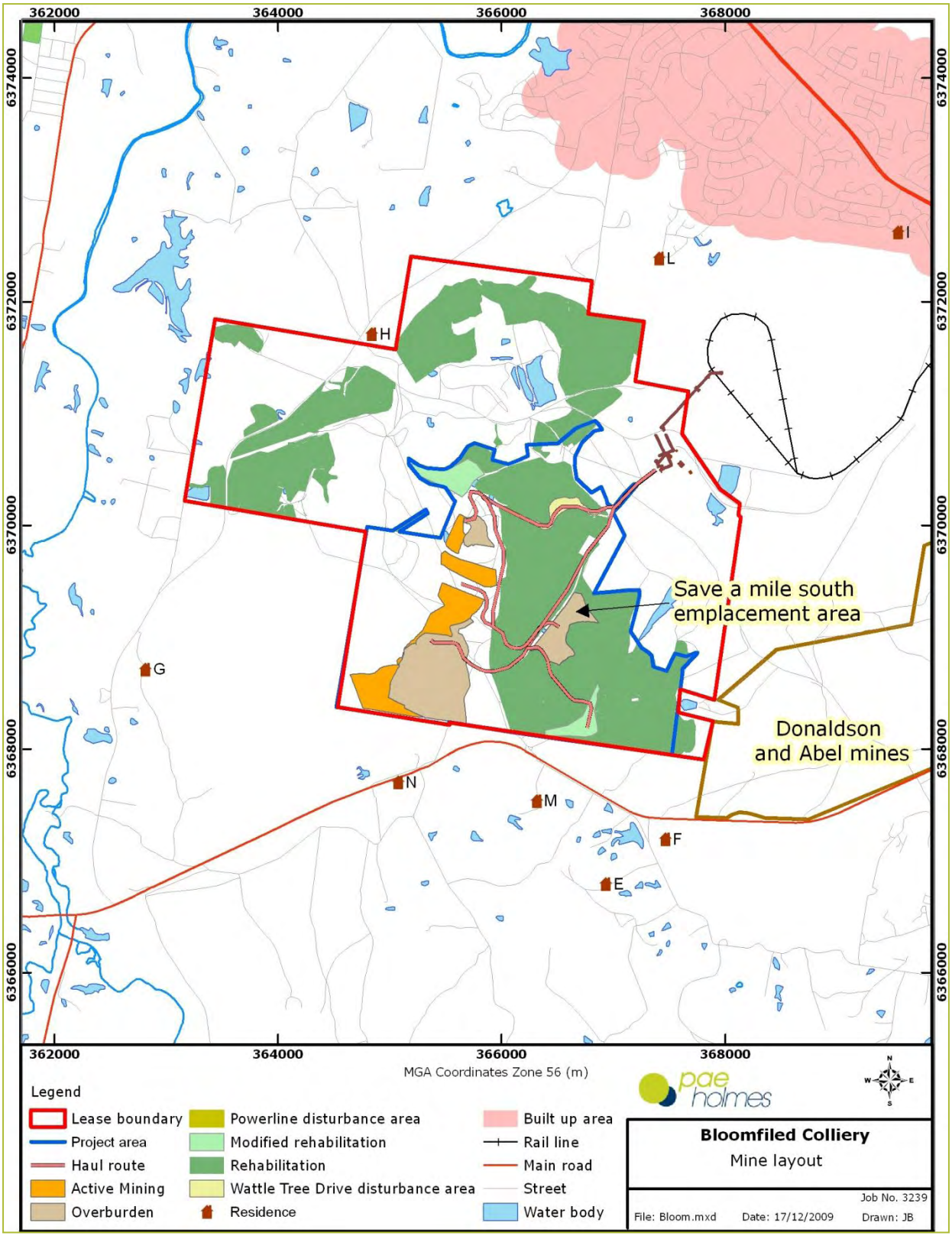


Figure 1: Site layout for Bloomfield Colliery Stage 2

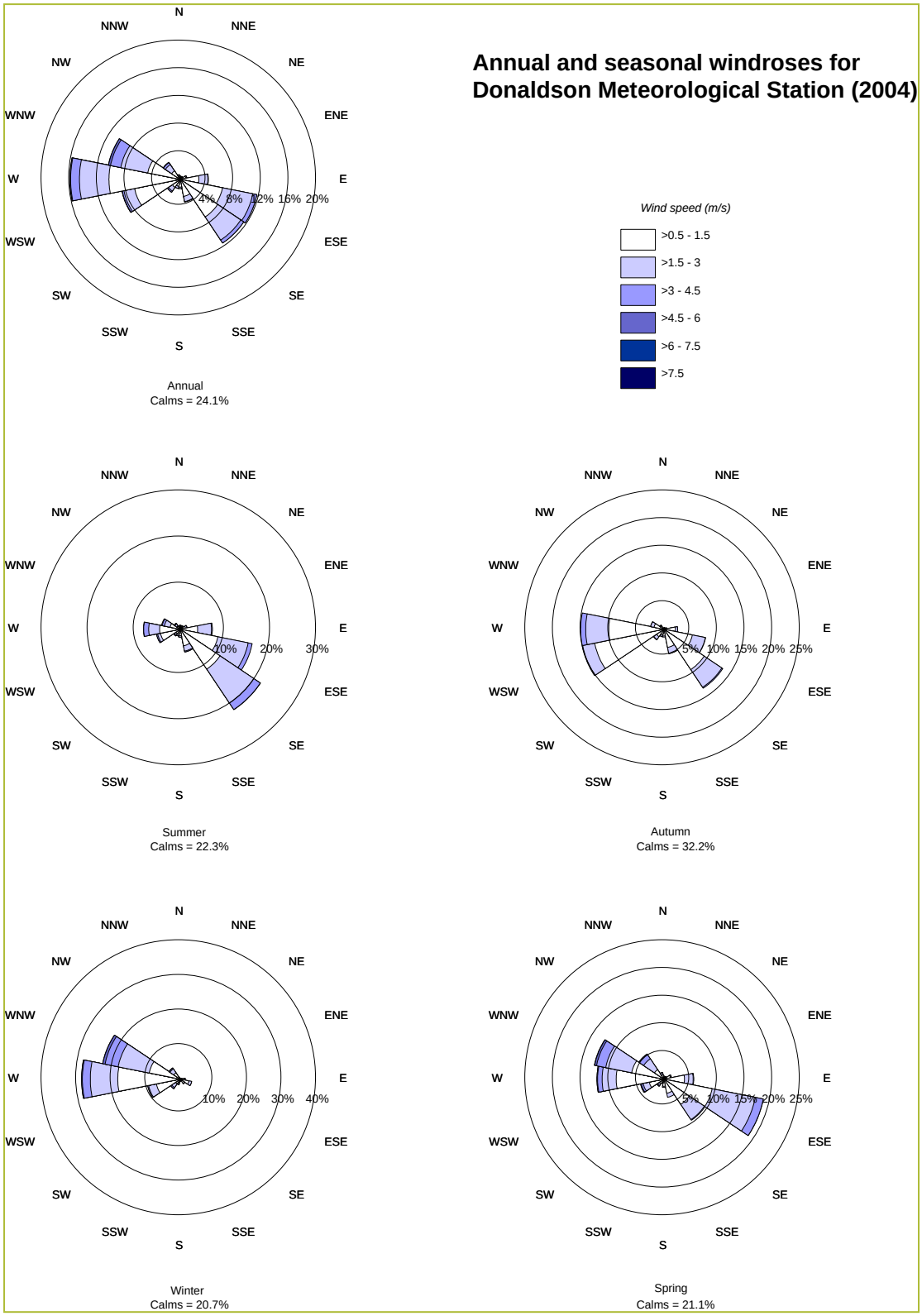


Figure 2: Annual and seasonal windroses for Donaldson 2004

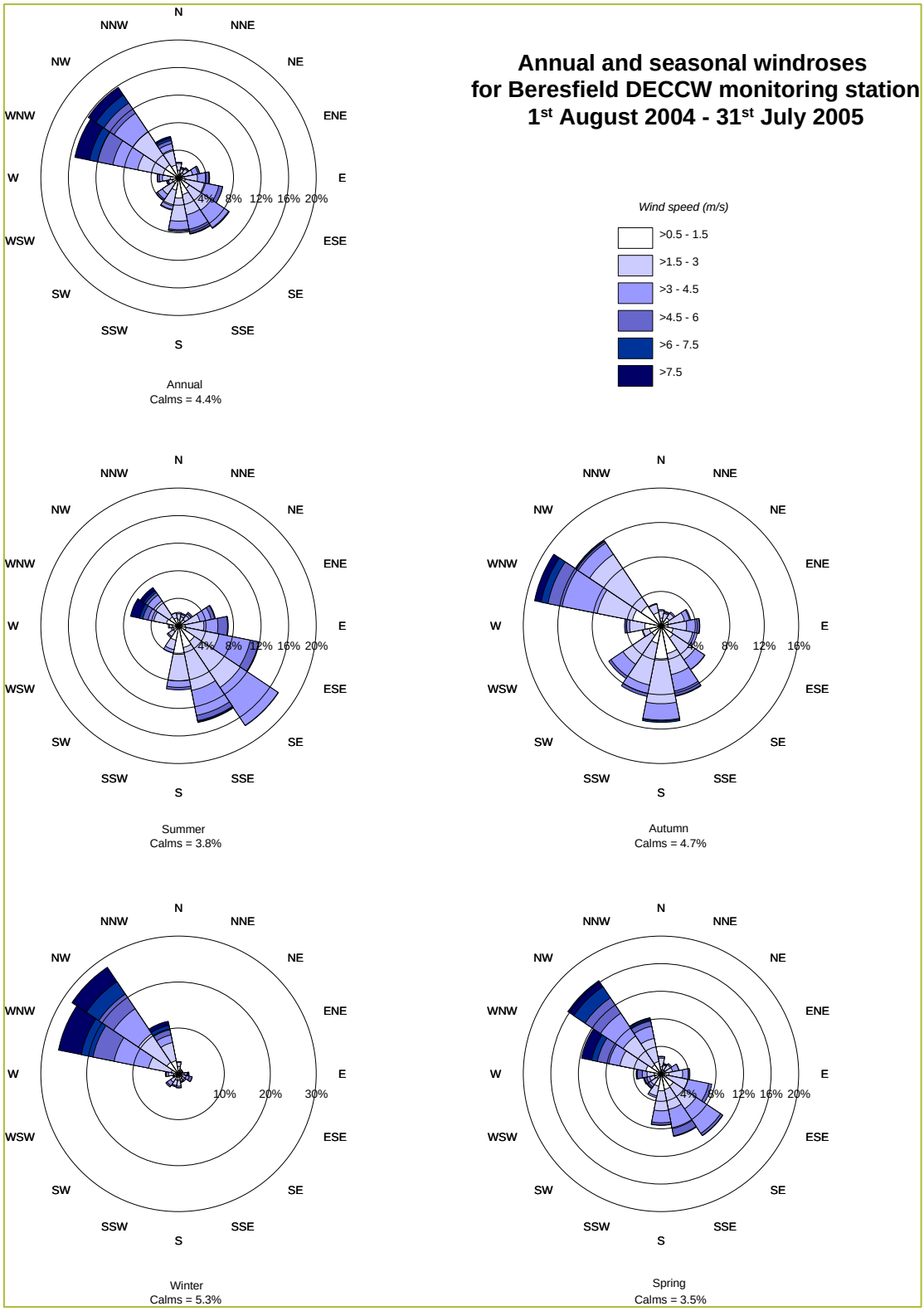
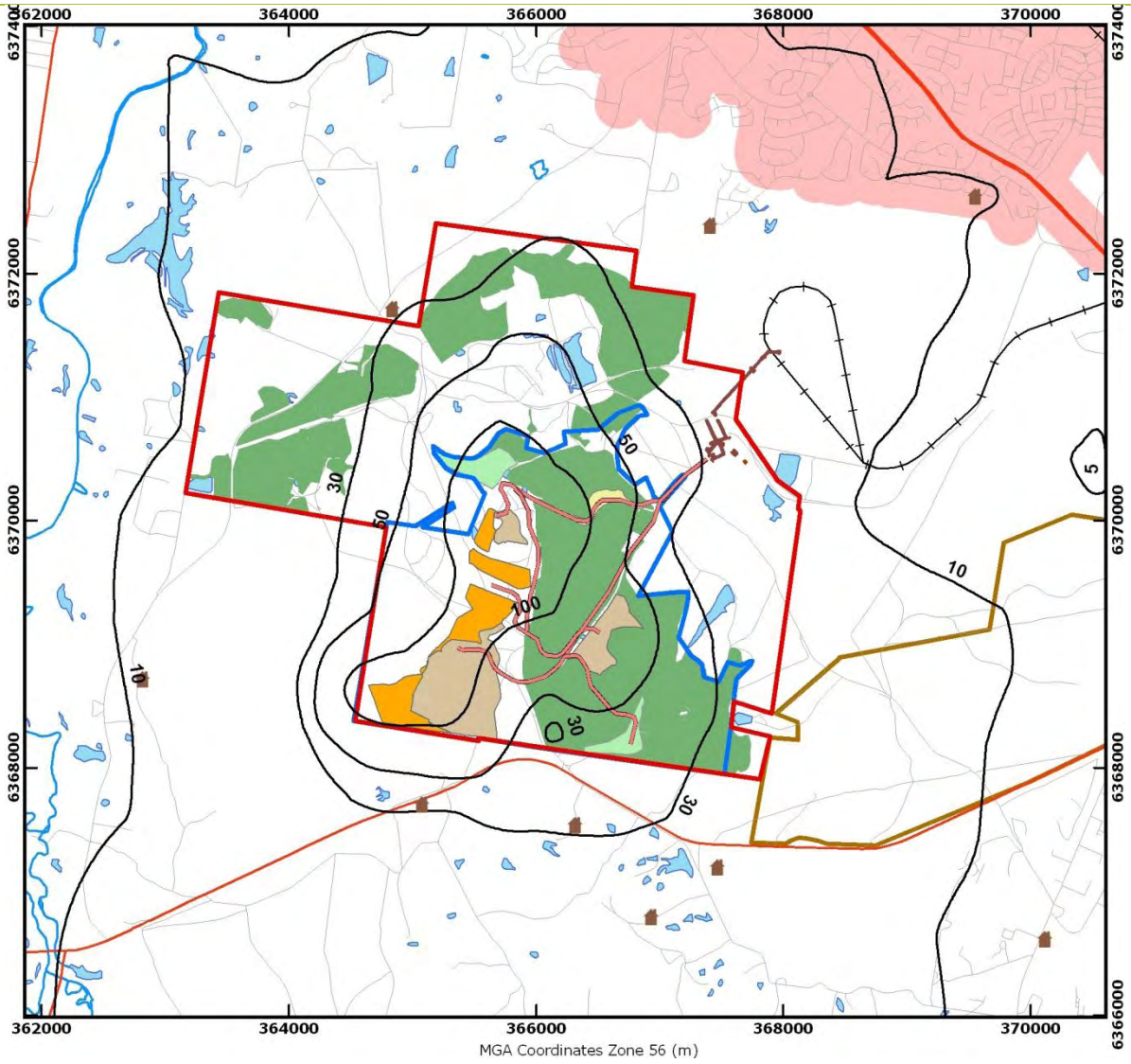
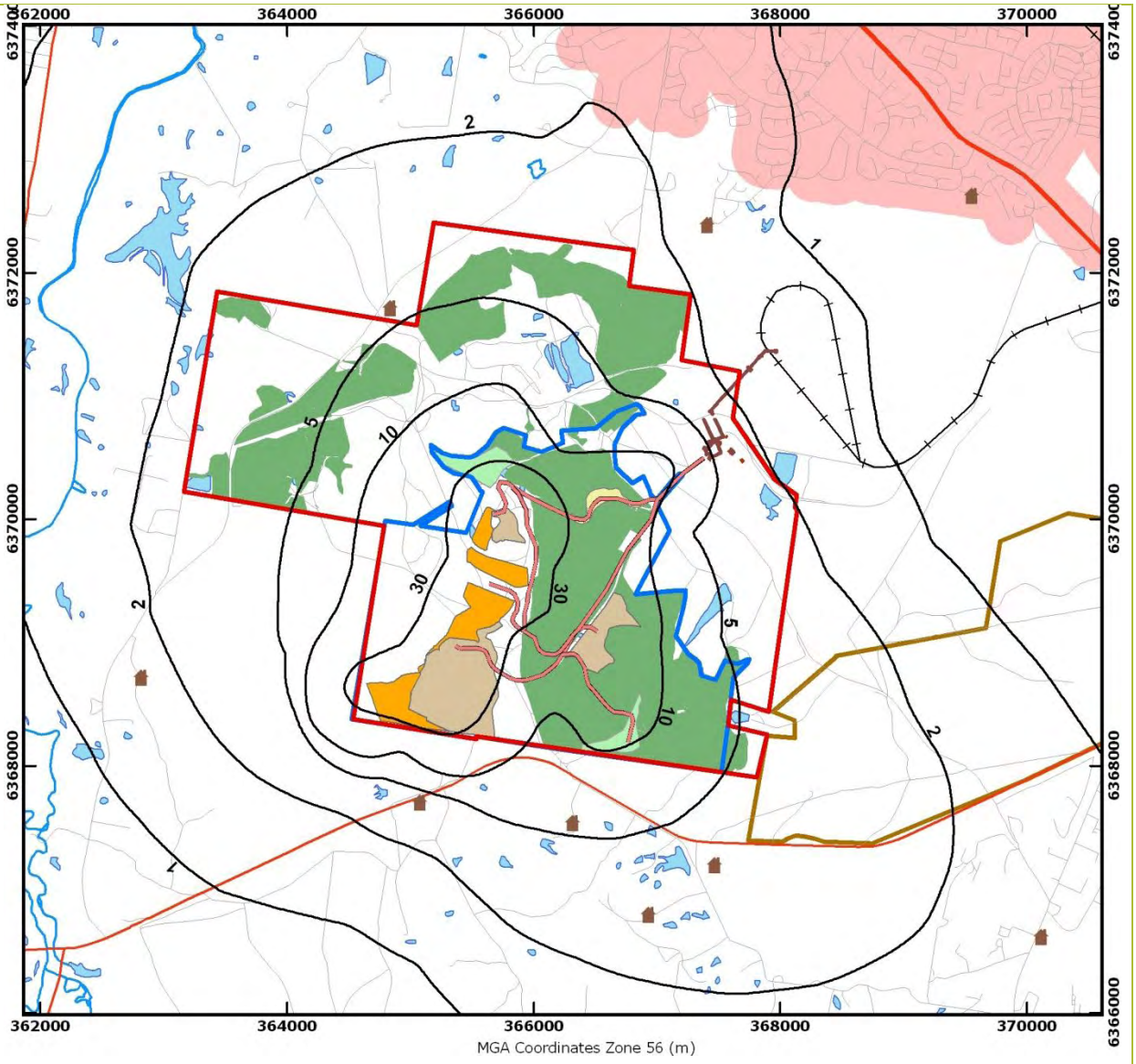


Figure 3: Annual and seasonal windroses for Bloomfield August 2004 to July 2005



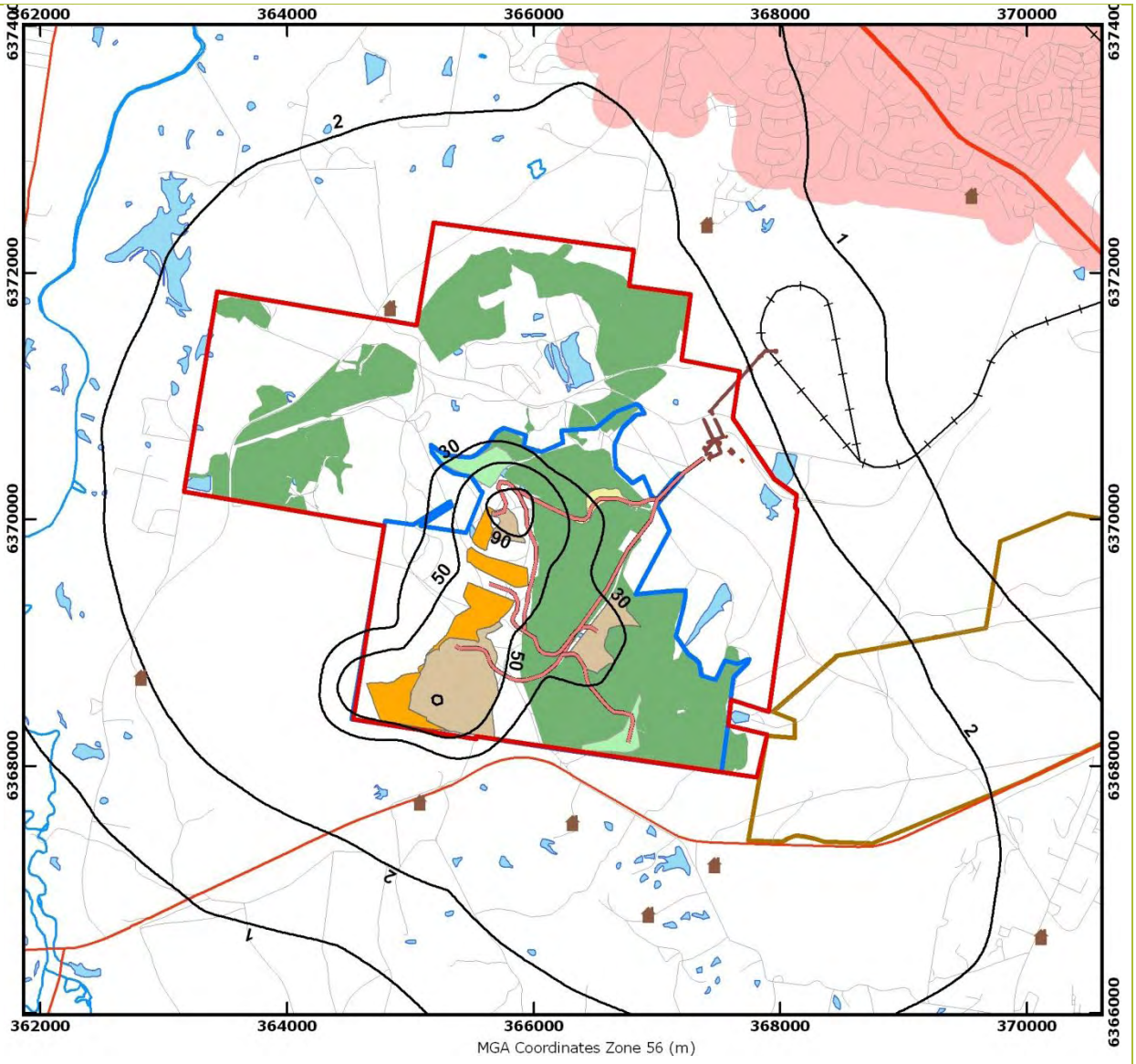
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Bloomfield	Stage 2	Maximum	24-hour
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	DECCW =50 µg/m³	Bloom0405	J. Beaney

Figure 4: Predicted 24-hour maximum PM_{10} concentrations for Stage 2 – Bloomfield Colliery



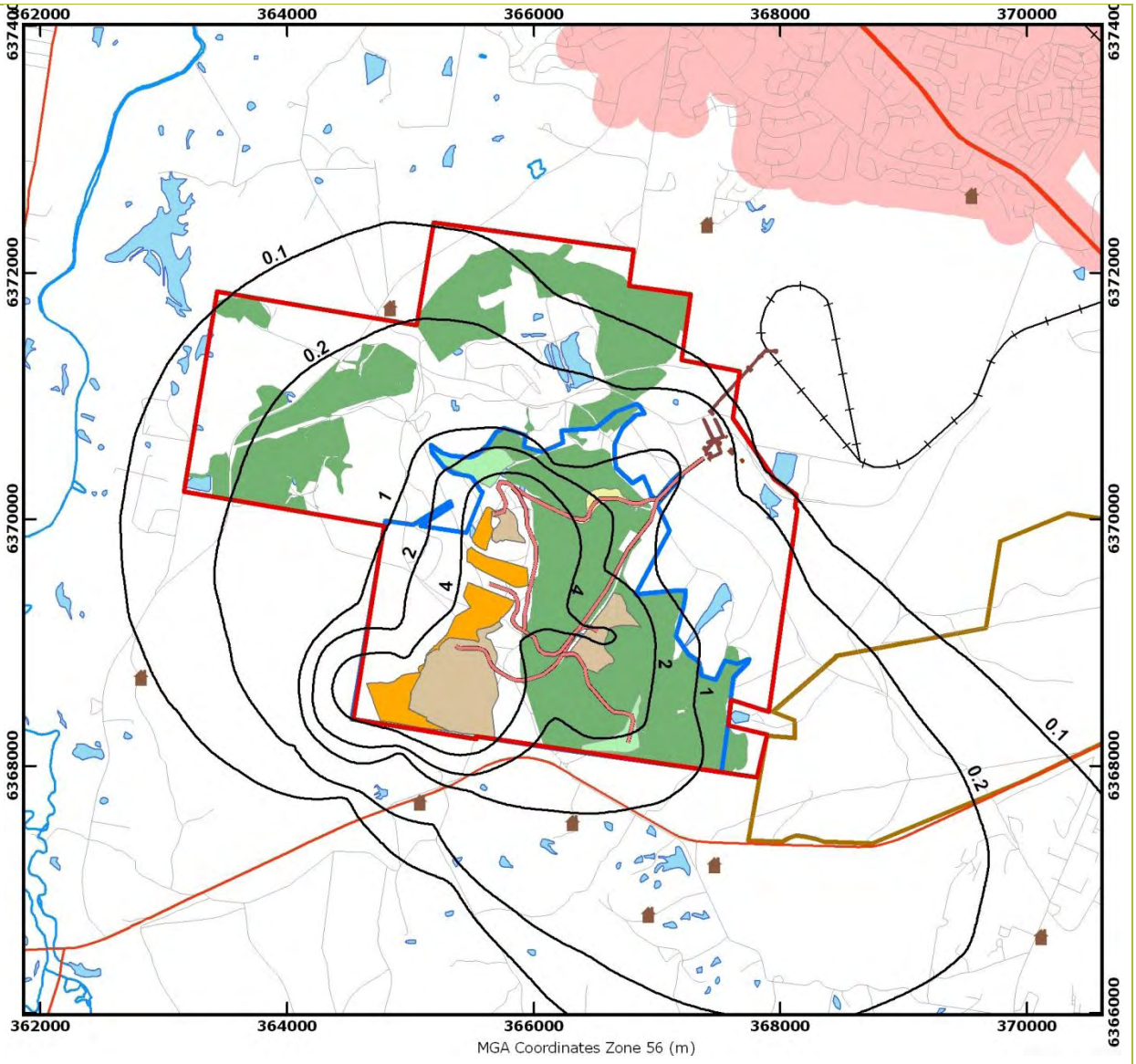
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Bloomfield	Stage 2	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	DECCW =30 µg/m³	Bloom0405	J. Beaney

Figure 5: Predicted annual average PM_{10} concentrations for Stage 2 – Bloomfield Colliery



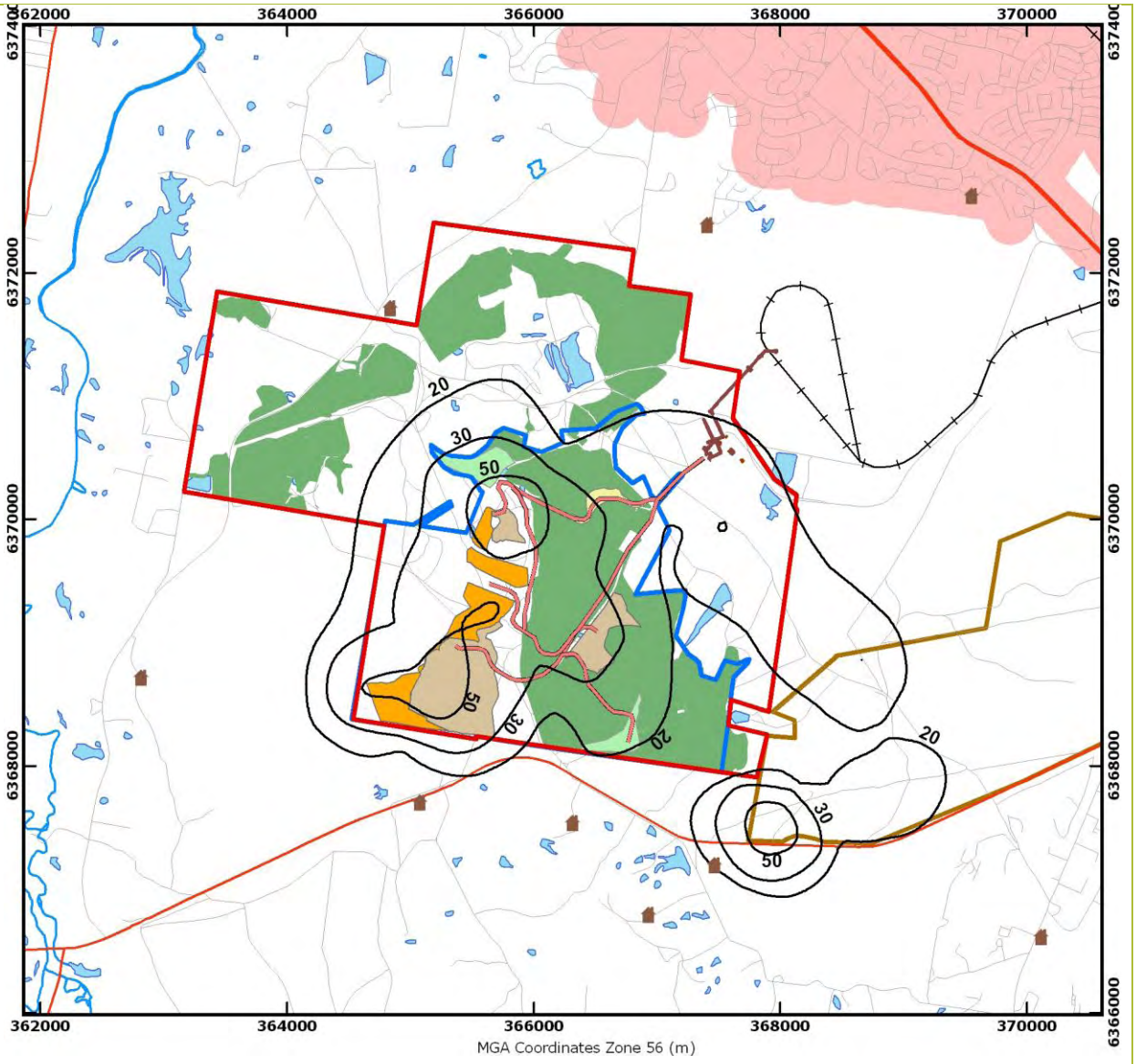
Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP	Bloomfield	Stage 2	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	DECCW =90 µg/m³	Bloom0405	J. Beaney

Figure 6: Predicted annual average TSP concentrations for Stage 2 – Bloomfield Colliery



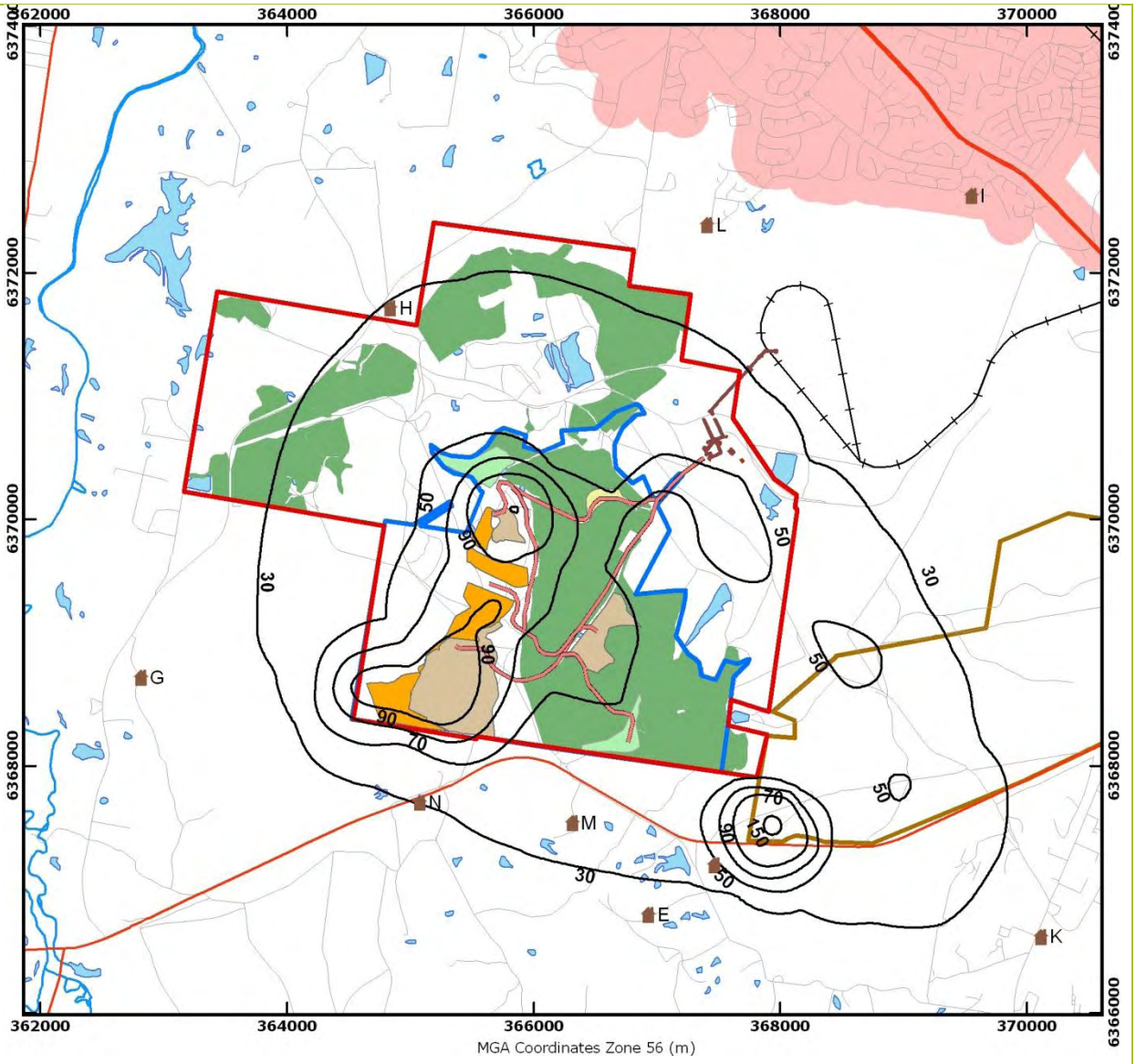
Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust deposition	Bloomfield	Stage 2	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	g/m^2/month	DECCW=2 g/m^2/month	Bloom0405	J. Beaney

Figure 7: Predicted annual average dust deposition for Stage 2 – Bloomfield Colliery



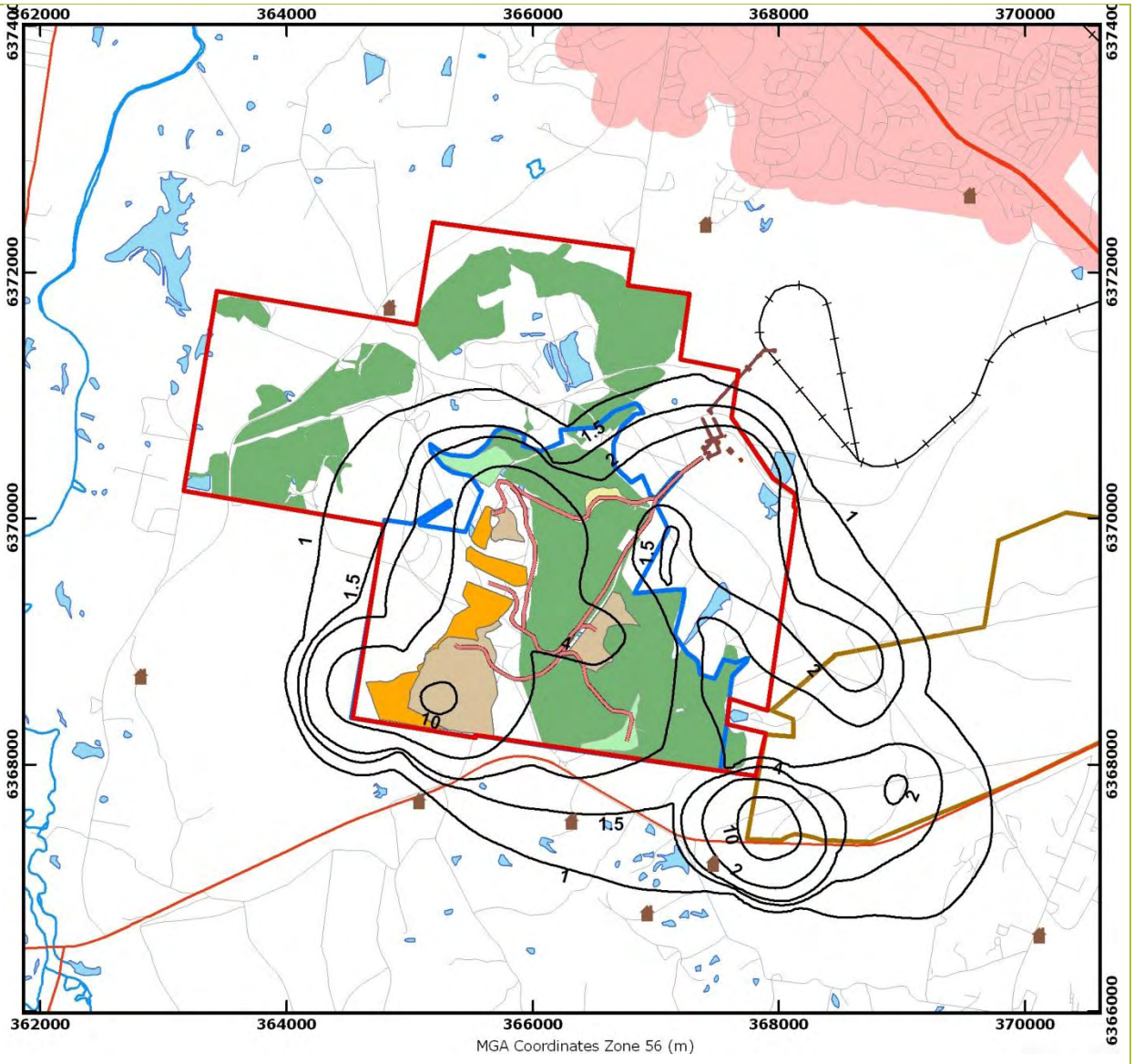
Species:	Location:	Scenario:	Percentile:	Averaging Time:
PM_{10}	Bloomfield	Stage 2	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	DECCW =30 µg/m³	Bloom0405	J. Beaney

Figure 8: Predicted annual average PM_{10} concentration for Stage 2 – Bloomfield Colliery and other sources



Species:	Location:	Scenario:	Percentile:	Averaging Time:
TSP	Bloomfield	Stage 2	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	DECCW =90 µg/m³	Bloom0405	J. Beaney

Figure 9: Predicted annual average TSP concentration for Stage 2 – Bloomfield Colliery and other sources



Species:	Location:	Scenario:	Percentile:	Averaging Time:
Dust deposition	Bloomfield	Stage 2	Average	Annual
Model Used:	**Units:**	**Guideline:**	**Met Data:**	**Plot:**
ISCMOD	µg/m³	DECCW = 4 g/m²/month	Bloom0405	J. Beaney

Figure 10: Predicted annual average dust deposition for Stage 2 – Bloomfield Colliery and other sources

Appendix D – Aboriginal Heritage Impact Assessment

SouthEast archaeology
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BLOOMFIELD COLLIERY, HUNTER VALLEY, NEW SOUTH WALES: COMPLETION OF MINING AND REHABILITATION PROJECT - ABORIGINAL HERITAGE IMPACT ASSESSMENT - ADDENDUM REPORT TO ASSESS POWERLINE RELOCATION

Prepared by Peter Kuskie, South East Archaeology Pty Ltd

On behalf of Bloomfield Collieries Pty Ltd

9 October 2009

Introduction:

Bloomfield Collieries Pty Ltd has obtained a Part 3A Major Project Approval (3 September 2009) under the *Environmental Planning and Assessment Act 1979* (EP&A Act) for the completion of open-cut coal mining and rehabilitation of areas within Mining Lease CCL761.

The project area is located several kilometres south of East Maitland in the lower Hunter Valley of NSW. It measures a total of 290 hectares and includes all of the existing Mining Operations Plan approved area, as well as a workshop area, an access road to the workshop and a haul road from the active mining area to the washery coal stockpile pad.

South East Archaeology (Kuskie 2008) undertook an Aboriginal heritage impact assessment for the Part 3A project application. The investigation proceeded by recourse to the archaeological and environmental background of the locality, followed by a field survey undertaken with representatives of the local Aboriginal community, in accordance with the relevant Department of Environment, Climate Change and Water (DECCW) policies and Department of Planning (DoP) requirements.

The investigation focused on the "unmodified" portion of the study area of approximately 108 hectares (land yet to be mined area immediately west of the S-Cut and southwest of the Creek Cut) in which there remains some potential for heritage evidence. The remaining 182 hectares of the project area comprises land that has been extensively impacted by earthmoving works and building, such that there is negligible potential for any Aboriginal heritage evidence to survive.

The "unmodified" portion of the study area was subdivided and inspected within 26 environmentally discrete survey areas. Even within this "unmodified" area, levels of ground disturbance are typically high, due to the removal of the forest vegetation in early 2004 by earthmoving equipment under existing approvals (Kuskie 2008).

Six Aboriginal heritage sites, comprising 19 loci of identified evidence, were recorded within the 108 hectare unmodified portion of the study area. These site loci are all stone artefact occurrences and contain a total of 53 artefacts.

The identified artefact evidence occurs in a very low density distribution. Further artefacts are expected to occur across the unmodified study area in a distribution and density consistent with the survey results. However, notwithstanding that shallow deposits may be present in some forested areas or along the drainages where the A unit soil may have been retained, the potential for sub-surface deposits of artefacts that may be *in situ* and/or of research value is low to very low. Other types of heritage evidence (for example, scarred trees and grinding grooves) are not anticipated to occur within the unmodified study area (ie. very low or negligible potential) and other Aboriginal cultural values or associations have not been identified (Kuskie 2008).

Proposed Powerline Variation to Approved Project:

Bloomfield Collieries is seeking a variation under Section 75W of the EP&A Act to the Part 3A Major Project Approval to permit relocation of an existing powerline outside of the project approved area. The powerline supplies power for the Abel Water Management System, water cart filling station and P&H5700 rope shovel. Re-routing of the powerline would require the removal of approximately one hectare of native vegetation to the north of the current approval area.

Purpose and Scope of Additional Aboriginal Heritage Assessment:

South East Archaeology has been commissioned by Bloomfield Collieries to assess the potential impacts of the proposed powerline variation on Aboriginal heritage.

Consistent with the investigation undertaken to date for the approved project (Kuskie 2008), the principal aims of the additional assessment were to identify and record any Aboriginal heritage evidence or cultural values within the study area, assess the potential impacts of the proposal on this evidence, assess the significance of this evidence, and formulate recommendations for the conservation and management of this evidence, in consultation with the local Aboriginal community.

For the purpose of the additional Aboriginal heritage assessment, the study area is taken to be the zone of approximately five hectares marked on Figure 1, although project impacts will be confined to an area of approximately one hectare.

Methodology of Additional Aboriginal Heritage Assessment:

As an addendum to the investigation undertaken to date for the approved project (Kuskie 2008), the additional assessment has involved:

- Review of previous searches of the DECCW Aboriginal Heritage Information Management System (AHIMS) and other relevant indigenous heritage registers and planning instruments, along with other relevant information;
- Archaeological survey of the powerline study area with the Mindaribba Local Aboriginal Land Council (LALC), following the same methodology and consultation procedures established for the main project (Kuskie 2008). This was undertaken on 8 October 2009 by Peter Kuskie of South East Archaeology and Ricky-Jo Griffiths of the Mindaribba LALC; and
- Preparation of this addendum report to present the results of the investigation, assessment of the significance of any Aboriginal evidence identified, and recommendations for the management of such evidence, in consultation with the Mindaribba LALC.

Results and Discussion of Additional Aboriginal Heritage Assessment:

The additional powerline study area was subdivided into seven survey areas, on the basis of landform element and class of slope, each of which was inspected for Aboriginal heritage evidence. The locations of the individual survey areas are marked on Figure 1. A summary of the survey coverage is presented in Table 1.

The total survey coverage (ground physically inspected for heritage evidence) equated to approximately 8,040 m^2, or 16% of the study area. As this coverage only refers to an area of several metres width directly inspected by each member of the survey team, the actual coverage for obtrusive site types, such as rock shelters, scarred trees and grinding grooves, was significantly greater than this. The total effective survey coverage (*visible* ground surface physically inspected with potential to host heritage evidence) equated to around 882 m^2, or 1.8% of the study area.

No Aboriginal heritage evidence was identified within the study area, and no Aboriginal heritage sites have previously been recorded in this location.

The heritage potential of the landform units within the study area is low, generally due to the moderate gradients and in the case of the ridge crest, the high level of existing impacts. A very low density distribution of artefacts may occur across the study area, however the potential for sub-surface deposits of artefacts that may be *in situ* and/or of research value is very low. Other types of heritage evidence (such as grinding grooves or scarred trees) are not anticipated to occur within the study area and other Aboriginal cultural values or associations have not been identified during the course of the assessment.

The proposed powerline will result in impacts to a small proportion of the study area. In the absence of appropriate management and mitigation measures, it is concluded that the impacts of the proposal on Aboriginal heritage will be very low.

Recommendations:

In consideration of the limited nature of the proposed impacts, the results of the survey and community consultation, it is considered that the potential for significant impacts to occur to the Aboriginal heritage resource from the current proposal is very low. Therefore, there are no Aboriginal heritage constraints to the proposed works proceeding.

Under the terms of the *National Parks and Wildlife Act 1974* it is an offence to knowingly destroy, damage or deface an Aboriginal object without obtaining the prior written permission of the Director-General of DECCW or *in lieu*, Part 3A approval. Therefore, should any previously unrecorded Aboriginal sites or objects be detected during the course of development which are not covered by a Section 90 Aboriginal Heritage Impact Permit, work in the immediate vicinity of those objects would need to promptly cease and the finds be reported to DECCW and advice sought as to the appropriate course of action. Alternatively, if the Part 3A approval is extended to the study area, any Aboriginal objects identified can be managed in accordance with the Aboriginal Heritage Management Plan approved for the project. This is anticipated to involve salvage by surface collection of any items that may be identified, in consultation with the registered Aboriginal stakeholders.

References:

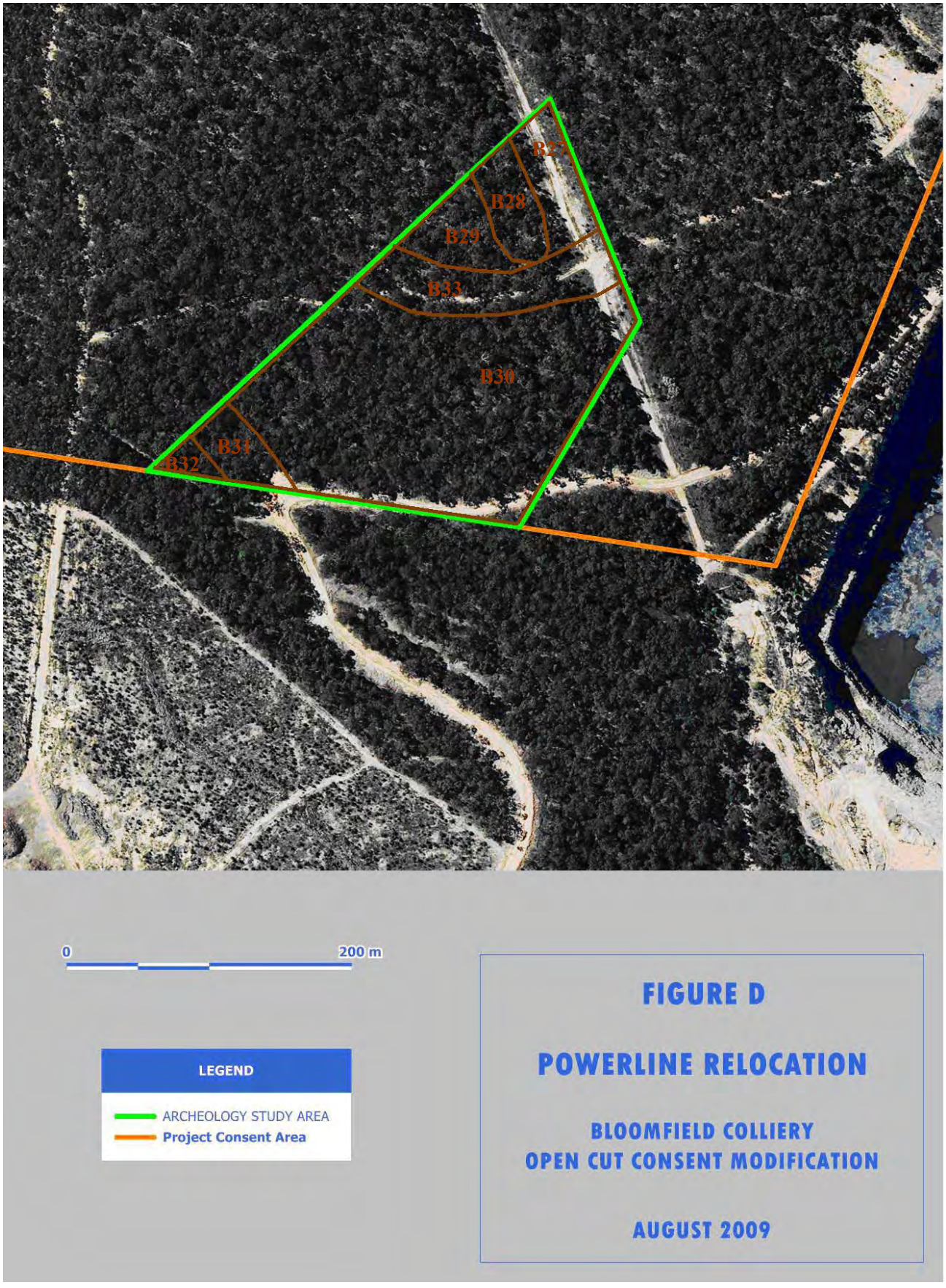
Kuskie, P. J. 2008 *Bloomfield Colliery, Hunter Valley, New South Wales: Completion of Mining and Rehabilitation Project - Aboriginal Heritage Impact Assessment*. Unpublished report to Bloomfield Collieries Pty Ltd.

Table 1: Archaeological survey coverage of powerline study area.

Survey Area	Landform Element	Slope	Distance to Water (metres)	Vegetation	Land Surface	Total Sample Area (m^2)	Surface Visibility (%)	Detection Limiting Factors	Archaeological Visibility %	Ground Disturbance	Effective Survey Coverage (m^2)	# of Artefacts	Artefact Density/m^2 of Effective Survey Coverage	Comments
B27	simple slope	moderate	<50	2	4, 5	1000	50	1	50	low-mod	500	0	-	power easement, vehicle track, erosion, vegetation cleared in easement; sandy loam, gravel; low potential
B28	drainage depression	moderate	<50	2	4	560	0.2	1, 2	0.2	low	3	0	-	dense leaf litter, some grass; low potential; minor sandstone cobbles; young Ironbarks and several older Eucalypts
B29	simple slope	moderate	<50	2	4	200	0.2	1, 2	0.2	low	1	0	-	dense leaf litter; low potential
B30	simple slope	moderate	>50	2	4, 5	3820	0.1-70	1, 2	0.1-60	low-mod	315	0	-	power easement, vehicle track, erosion, dozer pushes, vegetation cleared in easement; contour drain on southern border, now heavily overgrown, all B unit soil; dense grass, leaf litter in forest; mainly young Ironbark and Spotted Gum; low potential
B31	drainage depression	moderate	<50	2	4	400	0.5	1, 2	0.5	low	2	0	-	dense grass, leaf litter; low potential
B32	simple slope	moderate	<50	2	4	320	0.1	1, 2	0.1	low	1	0	-	dense grass, leaf litter; low potential
B33	ridge crest	gentle	>50	1, 2	4, 5	1740	0.5-60	1, 2	0.5-10	low-high	60	0	-	well formed old vehicle track; graded, heavily cut in; spoil mounds adjacent to track; some sandstone bedrock exposed; high disturbance along road and adjacent areas, has lowered heritage potential of crest from moderate-high to low

Vegetation: 1 = cleared/grass/crop; 2 = regrowth/native forest.
Land Surface: 1 = sheet erosion; 2 = gully erosion; 3 = stream bank erosion; 4 = vegetated; 5 = modified (eg. vehicle track).
Detection Limiting Factors: 1 = vegetation; 2 = leaf litter/gravel; 3 = sediment deposition; 4 = other.

Figure 1: Aboriginal heritage investigation area for proposed powerline, archaeological survey areas (brown shapes) (base map courtesy Bloomfield Collieries Pty Ltd).



Appendix E – Noise Impact Assessment

HEGGIES

REPORT 30-1573-R2

Revision 1

Bloomfield Colliery Modifications

Noise Impact Assessment

PREPARED FOR

Bloomfield Collieries Pty Ltd
Four Mile Creek Road
Ashtonfield NSW 2323

21 JULY 2010

HEGGIES PTY LTD
ABN 29 001 584 612

Bloomfield Colliery Modifications

Noise Impact Assessment

PREPARED BY:

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DOCUMENT CONTROL

Reference	Status	Date	Prepared	Checked	Authorised
30-1573-R2	Revision 1	21 July 2010	Nathan Archer	John Cotterill	John Cotterill
30-1573-R2	Revision 0	28 April 2010	Nathan Archer	John Cotterill	John Cotterill

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1 INTRODUCTION

Heggies Pty Ltd (Heggies) has been engaged by Bloomfield Collieries Pty Ltd (Bloomfield) to undertake an assessment of noise impacts associated with the proposed modification (Bloomfield Modifications) to the approved development (Project Approval 07_0087) to allow minor changes to the configuration of out of pit dumping and the realignment of a power easement. This report has been prepared for inclusion within the Environmental Assessment report to support an application to modify the Approval under section 75W of the Environmental Planning and Assessment Act.

Broadly, the objective of the assessment was to identify the potential impacts of noise from the proposed modification. The proposed modification includes:

- Small extensions to the areas currently approved for overburden dumping.
- Use of an existing road as an alternative haul route to reduce energy consumption.
- Recontouring and revegetation of areas that were rehabilitated over 20 years ago and do not meet current NSW Government standards.

Comment will also be made with regard construction activities associated with the relocation of an existing overhead powerline and easement which is required to enable the approved continuation of mining of Creek Cut and S Cut.

Advice with regard to effective mitigation strategies will be provided where necessary.

The noise assessment has been prepared with reference to Australian Standard AS 1055:1997 *Description and Measurement of Environmental Noise* Parts 1, 2 and 3 and in accordance with the Department of Environment, Climate Change and Water's (DECCW's) NSW Industrial Noise Policy (INP) and the Interim Construction Noise Guideline. Where issues relating to noise are not addressed in the INP, such as sleep disturbance, reference has been made to the NSW Environmental Noise Control Manual (ENCM).

The modification to the out of pit dumping area, alternative haul route and change to the powerline easement was not anticipated during the Environmental Assessment (EA) process that commenced in 2007. The need to modify the out of pit areas for the emplacement of overburden provides an opportunity to make improvements to three small areas that were rehabilitated over 20 years ago. The area will be designed to ensure that the current standards are met in relation to slope and final landform.

2 PROPOSAL DETAILS

The proposed modifications to the approved Bloomfield Colliery operations are detailed below and are illustrated in **Figure 1.**

2.1 Operational Activities

South-East Area – Overburden Dumping and Rehabilitation (Modification Area B)

An out-of-pit area to the east of the approved haul road (Area B as shown in **Figure 1**) was rehabilitated approximately 20 years ago. Due to the historic nature of the rehabilitation, it does not reflect current standards particularly in relation to slope and final landform requirements. To maximise operational efficiencies and improve final land shaping and vegetation cover in this area, Bloomfield proposes to place approximately 1.2 million bank cubic metres (bcm's) of overburden in this area prior to reshaping and revegetation. Area B will be included in the end of mine design and shaped in accordance with current rehabilitation standards.

Equipment proposed for these works will be that used for the currently approved operation as described by Section 2.6.2 of the EA (The Bloomfield Group, 2009), with no additional equipment to be introduced for these works. Rear dump haul trucks will transport overburden material to the area with dozers pushing and shaping material prior to topsoil application and seeding.

Northern and South-Eastern Areas – Out-of-Pit Reshaping and Rehabilitation (Modification Areas C and E).

Two out-of-pit areas (Areas C and E as shown in **Figure 1**) are former mining areas consisting of overburden material with some minor shaping and grass seeding. The areas have been stabilised with grass cover and there are a few native shrubs and trees that have regenerated naturally. To improve these areas and rehabilitate to current standards, minor import of overburden to reshape and improve drainage is proposed, as well as revegetation. Equipment to be used will be as for modification Area B.

Work in Area C would occur over approximately three (3) months during the approved "Stage 2" of mining.

Due to the minor nature of the works in Area E, it is expected the overburden emplacement and shaping would only take 70 hours. However, this work would be scheduled over a three (3) month period to enable normal rates of dumping and the continuation of mining.

2.2 Construction Activities

Construction of an Overhead Powerline and Easement (Modification Area D)

An existing overhead powerline and easement is located to the north-west of the approved Bloomfield mine area. The powerline extends from a previous open cut mine area in the north of the Bloomfield Colliery site into the current Creek Cut area. The powerline currently provides power for the water cart filling station, water pumps and the rope shovel.

To enable the approved expansion of Creek Cut and S Cut to proceed, the southern section of this powerline, within the current approved Bloomfield Mine area, needs to be relocated.

It is proposed to relocate a section of the powerline within Area D as shown in **Figure 1**. This would require construction of a 40 metre wide easement, removing approximately one hectare of native vegetation.

Construction would consist of marking the easement, vegetation clearing within the easement, installation of posts and lines, and connection to the existing line. The existing line and posts would then be removed.

It is anticipated that this work will be undertaken within six months of the modification being approved and construction works would be less than six weeks in duration.

Development of Wattle Tree Drive as an Alternative Haul Route

An existing access road between the northern open cut pit (Creek Cut) and the north-eastern end of the haul road leading to the washery stockpiles has been used for some years by light vehicles. Bloomfield proposes to upgrade this access ("Wattle Tree Drive") so that it can be used as an alternative haul road and general access road between the northern pit operations and the washery stockpiles. The location of this proposed alternative haul route is entirely within previously rehabilitated spoil emplacement areas and is shown as Area A on **Figure 1**.

Use of this alternative route will reduce haulage distances during times when coal is being extracted from Creek Cut and the northern areas of S Cut. Some cut and fill and slope stabilisation works will be required to construct the road, which will be used by coal trucks and general vehicles.

So that the road can be used as an alternative haul route, the existing track will be widened and improvements made to the horizontal alignment and road surface. The southern and northern batters will be shaped and stabilised as part of the construction works.

Figure 1 Open Cut Consent Modification Areas

3 NOISE MANAGEMENT

Selecting appropriate noise management strategies for the proposed Bloomfield Modifications involves the following steps:

- Determining the noise reduction required to achieve the project-specific noise levels.
- Identifying the specific characteristics of the industry and the site that would indicate a preference for specified measures.
- Examining the mitigation strategies chosen by similar industries on similar sites with similar requirements for noise reduction; and considering that strategy's appropriateness for the subject development.
- Considering the range of noise-control measures available.
- Considering community preferences for particular strategies. This is especially important when the community has particular sensitivities to noise.

The preference ranking (from most preferred to least preferred) for noise mitigation strategies is as follows:

- **Land-use controls** - a long-term strategy preferable to other measures when such strategic decisions are possible in planning land use, as it separates noise-producing industries from sensitive areas and avoids more expensive short-term measures.
- **Control at the source** - Best Management Practice (BMP) and Best Available Technology Economically Achievable (BATEA). These strategies serve to reduce the noise output of the source so that the surrounding environment is protected against noise.
- **Control in transmission** - the next best strategy to controlling noise at the source. It serves to reduce the noise level at the receiver but not necessarily the environment surrounding the source.
- **Receiver controls** - the least-preferred option, as it protects only the internal environment of the receiver and not the external noise environment.

The proponent will take into account the cost-effectiveness of strategies in determining how much noise reduction is affordable. A proponent's choice of a particular strategy is likely to have unique features due to the economics of the industry and site specific technical considerations.

The above steps and the range of measures described in this chapter can be used as a guide in assessing the strength of the proponent's mitigation proposals. Where a proposed mitigation strategy will not achieve the desired noise reduction and leaves a remaining noise impact, the problem needs to be solved by negotiation between the land owner and regulatory authority.

4 IMPACT ASSESSMENT PROCEDURES

4.1 General Objectives

Responsibility for the control of noise emission in New South Wales is vested in Local Government and the DECCW. The INP was released in January 2000 and provides a framework and process for deriving noise criteria for consents and licences that will enable the DECCW to regulate premises that are scheduled under the Protection of the Environment Operations Act, 1997.

The specific policy objectives are:

- To establish noise criteria that would protect the community from excessive intrusive noise and preserve amenity for specific land uses.
- To use the criteria as the basis for deriving project specific noise levels.
- To promote uniform methods to estimate and measure noise impacts, including a procedure for evaluating meteorological effects.
- To outline a range of mitigation measures that could be used to minimise noise impacts.
- To provide a formal process to guide the determination of feasible and reasonable noise limits for consents or licences that reconcile noise impacts with the economic, social and environmental considerations of industrial development.
- To carry out functions relating to the prevention, minimisation and control of noise from premises scheduled under the Act.

4.2 Assessing Intrusiveness

For assessing intrusiveness, the background noise level must be measured. The intrusiveness criterion essentially means that the equivalent continuous noise level (L_{Aeq}) of the source should not be more than five decibels above the measured background level (L_{A90}).

4.3 Assessing Amenity

The amenity assessment is based on noise criteria specific to land use and associated activities. The criteria relate only to industrial-type noise and do not include road, rail or community noise. The existing noise level from industry is measured. If it approaches the criterion value, then noise levels from new industries need to be designed so that the cumulative effect does not produce noise levels that would significantly exceed the criterion. For high-traffic areas there is a separate amenity criterion.

An extract from the INP that relates to the amenity criteria is given in **Table 1** and **Table 2**.

Table 1 Amenity Criteria - Recommended L_{Aeq} Noise Levels from Industrial Noise Sources

Type of Receiver	Indicative Noise Amenity Area	Time of Day	Recommended $L_{Aeq(Period)}$ Noise Level (dBA)	
			Acceptable	Recommended Maximum
Residence	Rural	Day	50	55
		Evening	45	50
		Night	40	45
	Suburban	Day	55	60
		Evening	45	50
		Night	40	45
	Urban	Day	60	65
		Evening	50	55
		Night	45	50
School classrooms - internal	All	Noisiest 1 hour period when in use	35	40
Hospital wards	All	Noisiest 1 hour period		
- internal			35	40
- external			50	55
Place of worship - internal	All	When in use	40	45
Area specifically reserved for passive recreation (eg National Park)	All	When in use	50	55
Active recreation area (eg school playground, golf course)	All	When in use	55	60
Commercial premises	All	When in use	65	70
Industrial premises	All	When in use	70	75

Note: Daytime 7.00 am to 6.00 pm; Evening 6.00 pm to 10.00 pm; Night-time 10.00 pm to 7.00 am, On Sundays and Public Holidays, Daytime 8.00 am - 6.00 pm; Evening 6.00 pm - 10.00 pm; Night-time 10.00 pm - 8.00 am.
The L_{Aeq} index corresponds to the level of noise equivalent to the energy average of noise levels occurring over a measurement period.

Table 2 Modification to Acceptable Noise Level (ANL)* to Account for Existing Levels of Industrial Noise

Total Existing L_{Aeq} noise level from Industrial Noise Sources	**Maximum L_{Aeq} Noise Level for Noise from New Sources Alone, dBA**
≥ Acceptable noise level plus 2 dBA	If existing noise level is *likely to decrease* in future acceptable noise level minus 10 dBA If existing noise level is *unlikely to decrease* in future existing noise level minus 10 dBA
Acceptable noise level plus 1 dBA	Acceptable noise level minus 8 dBA
Acceptable noise level	Acceptable noise level minus 8 dBA
Acceptable noise level minus 1 dBA	Acceptable noise level minus 6 dBA
Acceptable noise level minus 2 dBA	Acceptable noise level minus 4 dBA
Acceptable noise level minus 3 dBA	Acceptable noise level minus 3 dBA
Acceptable noise level minus 4 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 5 dBA	Acceptable noise level minus 2 dBA
Acceptable noise level minus 6 dBA	Acceptable noise level minus 1 dBA
< Acceptable noise level minus 6 dBA	Acceptable noise level

* ANL = recommended acceptable L_{Aeq} noise level for the specific receiver, area and time of day from **Table 1**

4.4 Assessing Sleep Disturbance

The DECCW has acknowledged that the relationship between maximum noise levels and sleep disturbance is not currently well defined. Criteria for assessing sleep disturbance has not been identified under the INP and hence, sleep arousal has been assessed using the guidelines set out in the ENCM Chapter 19-3.

To avoid the likelihood of sleep disturbance the ENCM recommends that the $L_{A1(1minute)}$ noise level of the source under consideration should not exceed the background noise level (L_{A90}) by more than 15 dBA when measured outside the bedroom window of the receiver during the night-time hours (10.00 pm to 7.00 am).

4.5 Construction Noise

The DECCW has prepared a new interim guideline covering construction noise. The NSW Interim Construction Noise Guideline sets out noise criteria applicable to construction site noise for the purpose of defining intrusive noise impacts. **Table 3** sets out the noise management levels and how they are to be applied. The approach is intended to provide respite for residents exposed to excessive construction noise outside the recommended standard hours whilst allowing construction during the recommended standard hours without undue constraints.

Table 3 Construction Noise Management

Time of Day	Management Level LAeq,(15mins) *	How to apply
Recommended standard hours : Monday to Friday 7:00am to 6:00pm Saturday 8:00am to 6:00pm No work on Sundays or public holidays	Noise affected RBL + 10 dBA	The noise affected level represents the point above which there may be some community reaction to noise. • Where the predicted or measured LAeq,(15mins) is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to minimise noise. • The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.
	Highly noise affected 75 dBA	The highly affected noise level represents the point above which there may be strong community reaction to noise. • Where noise is above this level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: 1. times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences. 2. if the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected RBL + 5 dBA	• A strong justification would typically be required for works outside the recommended standard hours. • The proponent should apply all feasible and reasonable work practices to meet the noise affected level. • Where all feasible and reasonable practices have been applied and noise is more than 5 dBA above the noise affected level, the proponent should negotiate with the community.

Based upon this document, the project specific construction noise goals outlined in **Table 3** will apply during the construction of the Wattle Tree Drive haul road at the nearest potentially affected residential locations.

5 PROJECT SPECIFIC NOISE CRITERIA

5.1 Existing Project Approval and Consent Conditions

Project Approval was granted on 3 September 2009 for the Bloomfield Project (Application No: 07_0087). The relevant Consent Conditions relating to noise are reproduced below.

Schedule 3 NOISE

Noise Impact Assessment Criteria

1. The Proponent shall ensure that the noise generated by the project does not exceed the noise impact assessment criteria in ***Table 4:***

Table 4 Operational noise impact assessment criteria

Morning Shoulder	***Day***	***Evening***	***Night***		***Location and Locality***	
$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{Aeq(15min)}$	$L_{A1(1min)}$		
40	*35*	*35*	*35*	*45*	*E*	*Browns Road, Black Hill*
42	*35*	*35*	*35*	*45*	*F*	*Black Hill Road, Black Hill*
43	*39*	*42*	*37*	*45*	*G*	*Buchanan Road, Buchanan*
35	*35*	*35*	*35*	*45*	*H*	*Mt Vincent Road, Louth Park*
35	*35*	*35*	*35*	*45*	*L*	*Kilshanny Avenue, Ashtonfield*
48	*39*	*39*	*37*	*46*	*M*	*John Renshaw Drive, Buttai*
43	*42*	*42*	*35*	*46*	*N*	*Lings Road, Buttai*

Notes

- *To interpret the locations in Table 1, see Appendix 2.*
- *The limits in Table 1 are to apply under meteorological conditions of up to 3 m/s at 10 m above ground level, excluding F and G class inversions as described in the NSW Industrial Noise Policy.*

However, if the Proponent has a written negotiated noise agreement with the landowner of any land, and a copy of this agreement has been forwarded to the Department and DECC, then the Proponent may exceed the noise limits in Table 1 on that land in accordance with the negotiated noise agreement.

Cumulative Noise Criteria

2. The Proponent shall take all reasonable and feasible measures to ensure that the noise generated by the project combined with the noise generated by other mines does not exceed the following amenity criteria at any residence on, or on more than 25 percent of, any privately owned land:

• LAeq(11 hour) 50 dB(A) – Day;

• LAeq(4 hour) 45 dB(A) – Evening; and

• LAeq(9 hour) 40 dB(A) – Night.

Continuous Improvement

3. The Proponent shall:

(a) implement all reasonable and feasible noise mitigation measures;

(b) investigate ways to reduce the noise generated by the project; and

(c) report on these investigations and the implementation and effectiveness of these measures in the AEMR, to the satisfaction of the Director-General.

Monitoring

4. The Proponent shall prepare and implement a Noise Monitoring Program for the project to the satisfaction of the Director-General.

The Program must:

(a) be prepared in consultation with DECC and be submitted to the Director-General for approval within 6 months of the date of this approval; and

(b) include:

a combination of unattended and attended monitoring measures; and

a noise monitoring protocol for evaluating compliance with the noise impact assessment criteria in this approval.

5.2 Bloomfield Project Environmental Assessment

5.2.1 Project Specific Noise Levels

It should be noted that the consent criteria determined in the Project Approval (07_0087) for the approved operation differed from the Project Specific Noise Levels (PSNLs) established with reference to the INP. The noise assessment is provided in the Environmental Assessment (refer Part 3A Environmental Assessment Project Application 07_0087 *Bloomfield Colliery Completion of Mining and Rehabilitation* and Heggies Report 30-1573-R1R1 *Noise and Blasting Assessment - Bloomfield Project*).

The intrusive and amenity noise assessment criteria based on the INP for the assessment localities are presented in **Table 5.**

Table 5 Bloomfield Project Specific Noise Levels

Location	Locality (Noise Amenity Area)	Period	Intrusiveness Criteria $L_{Aeq(15minute)}$	Amenity Criteria $L_{Aeq(Period)}$
E	Black Hill (Suburban)	Day	41 dBA	55 dBA
		Evening	40 dBA	45 dBA
F		Night	36 dBA	39 dBA
		Shoulder	44 dBA	47 dBA
G	Buchanan & Louth Park (Suburban)	Day	43 dBA	55 dBA
		Evening	41 dBA	45 dBA
H		Night	36 dBA	40 dBA
		Shoulder	45 dBA	48 dBA
L	Ashtonfield (Suburban)	Day	46 dBA	55 dBA
		Evening	46 dBA	45 dBA
		Night	43 dBA	40 dBA
		Shoulder	51 dBA	48 dBA
M	Buttai (Suburban)	Day	45 dBA	55 dBA
		Evening	43 dBA	45 dBA
N		Night	36 dBA	40 dBA
		Shoulder	53 dBA	48 dBA

For Monday to Saturday, Daytime 7.00 am - 6.00pm; Evening 6.00pm - 10.00pm; Night-time 10.00pm - 7.00am. Morning Shoulder 6.00 am to 7.00 am
On Sundays and Public Holidays, Daytime 8.00am - 6.00pm; Evening 6.00pm - 10.0 pm; Night-time 10.0 pm - 8.00am. Morning Shoulder 6.00 am to 8.00 am
1. The RBL's calculated for the Black Hill area were adopted as representative of the background levels at the occupied residential receivers on the Catholic Diocese Land (K1, K2 and K3).

The INP states that these criteria have been selected to protect at least 90% of the population, living in the vicinity of industrial noise sources, from the adverse effects of noise for at least 90% of the time. Provided the criteria in the INP are achieved, it is unlikely that most people would consider the resultant noise levels excessive.

5.2.2 Sleep Disturbance Noise Goals

The relevant sleep disturbance noise goals identified for each residential area are provided in **Table 6**. To minimise the potential for sleep disturbance in the morning shoulder period between 6.00 am and 7.00 am night-time RBL's have been used to set criteria instead of those recorded during the morning shoulder period.

Table 6 Sleep Disturbance Noise Goals

Location	Locality (Noise Amenity Area)	Period	Sleep Disturbance Criteria $L_{A1(1minute)}$
E	Black Hill (Suburban)	Night and Morning Shoulder	46 dBA
F			
G	Buchanan & Louth Park (Suburban)	Night and Morning Shoulder	46 dBA
H			
L	Ashtonfield (Suburban)	Night and Morning Shoulder	53 dBA
M	Buttai (Suburban)	Night and Morning Shoulder	46 dBA
N			

5.3 Bloomfield Modification Project Specific Noise Levels

This report will make reference to both the existing consent criteria and the Environmental Assessment PSNLs in considering the impact of noise at the nearest affected receivers.

5.4 Construction Noise Criteria

Similar to the intrusive project specific noise goals, the adopted project specific noise goal for construction activities is background plus 10 dBA (L_{A90} + 10 dBA). **Table 7** presents the noise goals for construction work along the Wattle Tree Drive haul road.

Table 7 Construction Noise Goals

Location	Locality (Noise Amenity Area)	Period	Project Specific Noise Criteria $L_{Aeq(15minute)}$ (dBA)
E	Black Hill (Suburban)	Day	46 dBA
F			
G	Buchanan & Louth Park (Suburban)	Day	48 dBA
H			
L	Ashtonfield (Suburban)	Day	51 dBA
M	Buttai (Suburban)	Day	50 dBA
N			

Construction may only occur between the hours of 7.00 am and 6.00 pm Monday to Friday, and 8.00 am to 1.00 pm Saturdays. For all other times construction noise must be inaudible at the receiver. No construction work is to take place on Sundays or Public Holidays.

6 ASSESSMENT OF NOISE IMPACTS

6.1 Operational Noise Modelling

6.1.1 Operational Noise Modelling Parameters

A computer model was used to predict noise emissions from operation of the proposed Bloomfield Modifications. The Environmental Noise Model (ENM) used has been produced in conjunction with the DECCW. The modelling process has utilised the Bloomfield noise model prepared by Heggies for the EA for the existing approved operation. The model has been updated to incorporate the latest topographic information available for the site and each of the proposed modifications to be assessed.

The Bloomfield noise model uses a three-dimensional digital terrain map giving all relevant topographic information was used in the modelling process. The model used this map, together with noise source data, ground cover, shielding by barriers and/or adjacent buildings and atmospheric information to predict noise levels at the nearest potentially affected receivers.

Topographic contours and operational descriptions were supplied by Bloomfield for the purpose of modelling noise from the proposed modifications.

Prediction of noise sources were carried out, under calm and prevailing atmospheric conditions (prevailing winds), for three operational scenarios namely;

- Area B dumping & rehabilitation.
- Area C dumping & rehabilitation.
- Area E dumping & rehabilitation.

Prevailing atmospheric conditions established during the previous EA have been utilised for the purpose of this assessment. Atmospheric parameters under which noise predictions were made are given in **Table 8**.

Table 8 Meteorological Parameters for Noise Predictions

	Temperature	**Humidity**	**Wind Speed**	**Wind Direction** (degrees from north)	**Temperature Gradient**
Calm (All periods)	20°C	65%	N/A	N/A	N/A
North-west wind (morning shoulder)	10°C	90%	3m/s	315	N/A
South-east wind (evening and morning shoulder	10°C	90%	3m/s	135	N/A

Other assumptions made relating to the modifications in the modelling process include:

- All acoustically significant plant and equipment operates simultaneously.
- Mobile noise sources, such as haul trucks, were modelled at typical locations and assumed to operate in repetitive cycles.
- All operations and noise controls described in the assessment of the approved operation will remain; operational modifications are limited to the location of the dump site and associated haul routes.
- Dumping and rehabilitation will not occur during the night-time period in Area B.

- Dumping and rehabilitation will not occur during the evening, night-time or morning shoulder periods in Areas C and E.

6.1.2 Acoustically Significant Plant and Equipment

Sound power levels of all plant and equipment operating on the site has been based on those modelled in the EA for the approved Bloomfield mine area. Since the publication of the EA, Heggies have performed on site sound power level measurements of some items of plant, where this has occurred the modelled sound power levels have been updated to include the measured data.

Plant operating within the modification areas will include CAT 793 dump trucks and a CAT D11 dozer unless stated in **Section 6.1.3**.

Sound power levels of relevant items of plant and equipment are contained within **Appendix A**.

6.1.3 Noise Controls, Mitigation and Management

The following noise controls are recommended for the proposed modified development. Noise mitigation and management procedures that have been incorporated into the noise model with the aim of achieving project specific noise criteria include the following:

Area B

- Daytime:
  - The height of the overburden emplacement area will be limited to an RL of 100m.
  - Daytime operations will be in the southern part of the dump to raise the dump and provide screening for the evening and morning shoulder operations.
- Evening and morning shoulder
  - The drill and clearing dozer will be working in a shielded location.
  - Dumping will only occur in the northern part of the dump.
  - The dozer will only operate in a shielded location in the northern part of the dump.
  - An earthen bund will be constructed in the approved dumping area to the south of the existing haul road to a minimum height of 80m RL (refer **Figure 2**).
  - There will be no coaling from S-Cut during the morning shoulder period.
- Night-time
  - There will be no dumping and rehabilitation in Area B during the night-time period.

Area C

- Dumping and rehabilitation will occur in Area C during the daytime period only.

Area E

- Dumping and rehabilitation in Area E will occur during the daytime period only.
- Dumping will be restricted to a maximum of 70 hours of work.
- A front end loader would replace the dozer at the Area E dump once the emplacement reaches an RL of 52m.

These recommended noise control procedures are consistent with those recommended for the approved Bloomfield mine area; namely that the dump site is required to be situated within the pit during night-time operations, hence no out of pit dumping and rehabilitation will occur at Areas B, C and E during the night-time period.

Figure 2 Proposed Haul Road Bund Location

6.1.4 Operational Noise Modelling Results

Noise emission levels were predicted from the proposed operation for the typical operational scenarios described in **Section 6.1.1** including the noise control and management procedures described in **Section 6.1.2**. Noise from all sources that contribute to the total noise from the site have been examined to identify characteristics that may cause greater annoyance (for example tonality, impulsiveness etc). The appropriate modifying factors, as outlined in the INP, have been applied where these characteristics are considered to be present.

A summary of the predicted operational noise levels from the proposed modifications for the worst case receiver locations are contained within **Table 9** to **Table 12**.

Exceedences of the existing consent criteria are highlighted in **bold** and exceedences of the consent criteria and EA PSNLS are highlighted in ***bold italics*** within the results tables.

Table 9 Predicted Bloomfield Modification Project Noise Levels – Area B Daytime

Location	**Period**	**Predicted Noise Level LAeq(15minute) (dBA)**						**Noise Criteria (dB LAeq)**	
Elevation of Dump		**75m**	**79m**	**81m**	**84m**	**90m**	**100m**	**Consent Conditions**	**PSNLs**
E Browns Road Black Hill	Day	31	32	35	**37**	**39**	**39**	35	41
F Black Hill Road Black Hill	Day	29	31	34	**36**	**39**	**39**	35	41
G Buchanan Road Buchanan	Day	38	38	38	38	38	38	39	43
H Mt Vincent Rd Louth Park	Day	<30	<30	<30	<30	<30	<30	35	43
L Kilshanny Avenue Ashtonfield	Day	<30	<30	<30	<30	<30	30	35	46
M John Renshaw Drive Buttai	Day	**40**	**41**	**42**	**42**	**44**	**45**	39	45
N Lings Road Buttai	Day	34	34	34	35	35	35	42	45

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLS are highlighted in bold italics within the results tables.

Table 10 Predicted Bloomfield Modification Project Noise Levels – Area B Evening and Morning Shoulder

Location	Period	Predicted Noise Level (dB LAeq)			Noise Criteria (dB LAeq)	
		Calm	NW	SE	Consent Conditions	PSNLs
E Browns Road Black Hill	Morning shoulder	<30	**41**	<30	40	44
	Evening	<30	N/A	<30	35	40
F Black Hill Road Black Hill	Morning shoulder	<30	**44**	<30	42	44
	Evening	<30	N/A	<30	35	40
G Buchanan Road Buchanan	Morning shoulder	<30	<30	38	43	45
	Evening	<30	N/A	39	42	41
H Mt Vincent Rd Louth Park	Morning shoulder	<30	<30	33	35	45
	Evening	<30	N/A	30	35	41
L Kilshanny Avenue Ashtonfield	Morning shoulder	<30	<30	**37**	35	48
	Evening	<30	N/A	**39**	35	46
M John Renshaw Drive Buttai	Morning shoulder	32	**47**	<30	48	48
	Evening	33	N/A	<30	39	43
N Lings Road Buttai	Morning shoulder	<30	31	<30	43	48
	Evening	<30	N/A	<30	42	43

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLS are highlighted in bold italics within the results tables.

Table 11 Predicted Bloomfield Modification Project Noise Levels – Area C

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)	Noise Criteria (dB LAeq)	
			Consent Conditions	PSNLs
E Browns Road, Black Hill	Day	30	35	41
F Black Hill Road, Black Hill	Day	<30	35	41
G Buchanan Road, Buchanan	Day	39	39	43
H Mt Vincent Rd, Louth Park	Day	<30	35	43
L Kilshanny Avenue Ashtonfield	Day	30	35	46
M John Renshaw Drive, Buttai	Day	38	39	45
N Lings Road, Buttai	Day	30	42	45

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLS are highlighted in bold italics within the results tables.

Table 12 Predicted Bloomfield Modification Project Noise Levels – Area E

Location	Period	Predicted Noise Level LAeq(15minute) (dBA)			Noise Criteria (dB LAeq)	
Elevation of Dump		52m (with dozer on dump)	56m (with front end loader on dump)	60m (with front end loader on dump)	Consent Conditions	PSNLs
E Browns Road Black Hill	Day	**41**	**41**	**41**	35	41
F Black Hill Road Black Hill	Day	**37**	**36**	**37**	35	41
G Buchanan Road Buchanan	Day	38	38	38	39	43
H Mt Vincent Rd Louth Park	Day	<30	<30	<30	35	43
L Kilshanny Avenue Ashtonfield	Day	<30	<30	<30	35	46
M John Renshaw Drive Buttai	Day	***46***	**45**	**45**	39	45
N Lings Road Buttai	Day	35	35	35	42	45

Exceedences of the existing consent criteria are highlighted in bold and exceedences of the consent criteria and EA PSNLS are highlighted in bold italics within the results tables.

6.1.5 Discussion

Area B - Daytime

Noise levels including dumping operations in Area B are predicted to meet the existing consent conditions at locations G, H, L and N during the daytime period. Noise levels are also predicted to meet the existing conditions of consent at locations E and F when the elevation of the dump is 81m or lower.

Operational noise levels from the Area B modification are predicted to exceed the existing consent criteria at location M during daytime operations and at locations E and F when the height of the dump exceeds 81m. However, noise levels at these locations are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project and are therefore unlikely to cause disturbance.

Area B – Evening and Morning Shoulder

Noise levels including dumping operations in Area B are predicted to meet the existing consent criteria at locations G, H and N during the evening and morning shoulder periods under calm and prevailing weather conditions with the proposed mitigation and management strategies in place and at all locations under calm weather conditions.

Operational noise levels from the Area B modification are predicted to exceed the existing consent conditions at locations E, F and M during the morning shoulder period under the influence of a prevailing NW wind and at location L during the evening and morning shoulder periods under the influence of a prevailing SE wind. Notwithstanding this, noise levels at these locations are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project and are therefore unlikely to cause disturbance.

Area C

Operational noise levels from the proposed Area C modification are predicted to meet the existing conditions of consent at all receiver locations during the daytime period under calm weather conditions.

Area E

Operational noise levels from the proposed Area E modification are predicted to meet the existing consent conditions at locations G, H, L and N during the daytime period. Noise levels at locations E, F and M are all predicted to exceed the existing consent criteria by up to 6 dBA.

Notwithstanding this, noise levels are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project at all locations with the exception of Location M where a 1 dBA exceedence is predicted with a dozer working on the dump. This 1 dBA exceedence is unlikely to cause disturbance during the daytime period.

It should be noted that the works required in Area E are minor in nature and will be limited to a total of 70 hours in daytime periods.

Additionally, since the operational scenario modelled is likely to represent an acoustically worst-case scenario, actual operational noise levels from the proposed modifications are likely to be less than those predicted.

6.2 Sleep Disturbance Analysis

In assessing sleep disturbance, typical L_{Amax} noise levels of plant and equipment to be used at the subject site during the night was used as input to the ENM acoustic model and predictions were made at the nearest residential areas under adverse weather conditions during the morning shoulder.

A summary of the predicted maximum noise levels at the most affected locations are contained within **Table 13.**

Table 13 Predicted Maximum Morning Shoulder Noise Levels – Area B

Location	Period	Predicted Noise Level L_{Amax} (dBA)		Sleep Disturbance Criteria ($L_{A1(1min)}$)	
		NW Wind	SE Wind	Consent Conditions	PSNLs
E Browns Road Black Hill	Morning Shoulder	**46**	<30	45	46
F Black Hill Road Black Hill		***48***	<30	45	46
G Buchanan Road Buchanan		<30	38	45	46
H Mt Vincent Rd Louth Park		<30	31	45	46
L Kilshanny Avenue Ashtonfield		<30	40	45	53
M John Renshaw Drive Buttai		***48***	34	46	46
N Lings Road Buttai		39	<30	46	46

The predicted L_{Amax} noise levels from the proposed Area B Modification will meet the sleep disturbance consent criteria at all locations for all operational scenarios considered with the exception of Locations E, F and M where exceedances of up to 3 dBA are predicted during the morning shoulder period under the influence of a NW wind.

As discussed in **Section 5.2.2**, in order to minimise the potential for sleep disturbance, noise goals are based on the night-time RBLs rather than those measured during the morning shoulder. However, it should be noted that during the morning shoulder period, noise levels are typically significantly higher than during the night-time due to the increase in road traffic along John Renshaw drive (measured noise levels during the morning shoulder period at locations E, F and M were between 8 and 17 dBA higher than those monitored during the night-time period (refer Heggies report 30-1573-R1R1 *Noise and Blasting Assessment – Bloomfield Project)*).

Furthermore, the use of the L_{Amax} noise level provides a worst-case prediction since the $L_{A1(1minute)}$ noise level of a noise event is likely to be less than the L_{Amax}. As such, the predicted 3 dBA exceedance is unlikely to cause sleep disturbance during the morning shoulder period.

Since it has been recommended that dumping and rehabilitation in the proposed modification areas does not occur in Areas C and E at night-time or during the morning shoulder period, sleep disturbance analysis has not been undertaken for these locations.

6.3 Construction Noise Modelling

6.3.1 Construction Scenarios

Development of Wattle Tree Drive as Alternative Haul Route (Modification Area A)

The construction of the alternative haul road will involve the widening and levelling of the existing track at Wattle Tree Drive. As part of the construction works the southern and northern batters will be shaped and stabilised.

It has been assumed that the following equipment will be utilised for the construction works:

- CAT D11 Dozer.
- CAT 16G Grader.
- CAT 365 Backhoe.

Noise modelling has considered the worst case construction scenario with all the plant operating at the south-western end of the haul road where the plant will be at its most elevated and exposed level.

Construction of Overhead Powerline and Easement (Modification Area D)

Construction of the overhead powerline and easement would involve the marking of the easement, vegetation clearing and the relocation of the powerline. It is anticipated that construction works would be less than 6 weeks in duration.

It has been assumed that the most acoustically significant equipment operating during the construction period will be a dozer clearing vegetation and marking the easement. This has been modelled at the most elevated level within modification area D to provide a worst case assessment.

6.3.2 Construction Noise Modelling Results

The maximum predicted noise levels due to the development of Wattle Tree Drive as an alternative haul route are less than 30 dBA at all locations and as such are well below the construction noise criteria. Furthermore, once the haul route is in place it is likely that operational noise impacts will be reduced due to the greater separation distances between the haul road and the nearest affected residences to the south.

The maximum predicted noise levels due to the clearing and marking of the easement within modification area D are also predicted to be less than 30 dBA and are significantly below the relevant construction noise criteria.

7 CONCLUSION

Heggies has conducted a noise impact assessment for the proposed modifications to operations at the Bloomfield Colliery located near Beresfield, NSW. The objective of the study was to assess the potential impact of noise from dumping and rehabilitation within the proposed modification areas B, C and E.

Operational noise levels were predicted under calm and prevailing meteorological conditions at the nearest affected residences to the site. With proposed noise controls, mitigation and management in place, operational noise levels are predicted to meet the existing consent criteria during the daytime at locations G, H, L and N during dumping and rehabilitation in Areas B and E and at all locations during dumping and rehabilitation in Area C.

Noise levels are predicted to exceed the existing daytime consent criteria at locations E, F and M during dumping and rehabilitation in Areas B and E. Notwithstanding this, noise levels are predicted to be below the project specific noise levels established with reference to the INP and reported in the EA for the approved development and are therefore unlikely to cause disturbance at the surrounding residential receivers.

Noise levels including dumping operations in Area B are predicted to meet the existing consent criteria at locations G, H and N during the evening and morning shoulder periods under calm and prevailing weather conditions.

Operational noise levels from the Area B modification are predicted to exceed the existing consent conditions at locations E, F and M during the morning shoulder period under the influence of a prevailing NW wind and at location L during the evening and morning shoulder periods under the influence of a prevailing SE wind. Notwithstanding this, noise levels at these locations are predicted to meet the project specific noise levels established with reference to the INP for the EA for the approved project and are therefore unlikely to cause disturbance.

The proposed activity in Areas B and E are necessary to ensure that the rehabilitation measures and final landform meets current standards as prescribed by the NSW Government. The long history of mining on the site and changing rehabilitation standards has prompted the need to make improvements. Whilst there may be some short term exceedence of noise criteria outlined in the Project Approval, the proposed modifications comply with the requirements of the Industrial Noise Policy.

The predicted L_{Amax} noise levels from the proposed Area B Modification are predicted to meet the existing sleep disturbance criteria with the exception of Locations E, F and M under adverse weather conditions. Notwithstanding this, predicted maximum noise levels are considered worst case and are unlikely to cause sleep disturbance during the morning shoulder period where existing noise levels are significantly higher due to the influence of road traffic on John Renshaw Drive.

Predicted construction noise levels from the development of Wattle Tree Drive as an alternative haul route and the construction of the overhead powerline and easement are predicted to be significantly below the relevant construction noise criteria.