

5 Threatened Species Assessment

The relevant requirements in the *Draft Guidelines for Threatened Species Assessment* (DEC and DPI, 2005) are considered below, since it is proposed that the Modification is to be approved via Part 3A of the EP&A Act, and there is currently no mechanism in place to remove the requirement to consider the Part 3A guideline (Table 19).

Table 19: Part 3A Guideline Requirements

Part 3A Guideline Requirement
Objectives
<i>Maintain or improve biodiversity values (i.e. there is no net impact on threatened species or native vegetation).</i>
<i>Conserve biological diversity and promote ecologically sustainable development</i>
<i>Protect areas of high conservation value (including areas of critical habitat).</i>
<i>Prevent the extinction of threatened species.</i>
<i>Protect the long-term viability of local populations of a species, population or ecological community.</i>
<i>Protect aspects of the environment that are matters of national environmental significance.</i>
Key Thresholds
<i>The development application needs to contain a justification of the preferred option based on:</i>
<i>whether or not the proposal, including actions to avoid or mitigate impacts or compensate to prevent unavoidable impacts will maintain or improve biodiversity values.</i>
<i>whether or not the proposal is likely to reduce the long-term viability of a local population of the species, population or ecological community.</i>
<i>whether or not the proposal is likely to accelerate the extinction of the species, population or ecological community or place it at risk of extinction.</i>
<i>whether or not the proposal will adversely affect critical habitat.</i>

It is noted that the Biobanking Assessment Methodology incorporates these objectives in the assessment and the “improve or maintain test” addresses each of the key thresholds.

6 EPBC Act Protected Matters Search and Preliminary Assessment

A search of the DEWHA Protected Matters Database was undertaken on 15 December 2009 using a 10 km radius (point co-ordinate -30.6418, 150.1641). The search identified three Threatened Ecological Communities, 17 threatened species and seven migratory species that may occur in the Modification area based on past records and habitat suitability. An initial assessment to determine the likelihood of occurrence of these communities and species (presence of suitable habitat mapped on-site and/or recorded in site surveys) has been undertaken (Appendix 2).

One EEC is known to occur at the Modification area (White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and derived native grasslands) and suitable habitat for two threatened species (Swift Parrot and Regent Honeyeater) and three migratory species (Fork-tailed Swift, Great Egret and Cattle Egret) although none of these species has been detected in current or previous surveys either on or adjacent to the site.

EPBC Act impact assessments utilising the Matters of National Environmental Significance, Significant Impact guidelines 1.1 *EPBC Act Policy Statement 1.1 - Significant Impact Guidelines* Matters of National Environmental Significance (DEHA 2009) are required for all EPBC Act listed threatened species, populations and ecological communities which are likely to occur or utilize resources at the Modification area. If it is determined that a significant impact is likely, a referral to the DEWHA is required to determine whether the proposal is a controlled action. A preliminary analysis indicated that no significant impacts are likely on any protected matter.

The combined effort of all threatened flora and fauna survey undertaken by GCNRC (2005), CES (2005) and ELA (this study) is provided in Appendix 7.

7 SEPP 44 Koala Assessment

Whilst the Koala is listed as a Vulnerable species in NSW under the TSC Act, it is not required to be assessed as part of a Biobanking Assessment as it is a predicted or ecosystem species. However, in order to satisfy SEPP 44, as the Modification area contained > 15% Koala feed trees as listed in Schedule 2 of SEPP 44, the area is “potential Koala habitat” as defined by SEPP 44 (Appendix 14). Surveys targeting Koala’s were accordingly undertaken.

Surveys targeting the Koala comprised spotlighting, playback of male calls and targeted scat searches. Spotlighting transects and call playback was undertaken on the night of the 7 and 8 December 2009, with a total of eight person hours of nocturnal surveys over two separate nights (see spotlight transects). Koala scat searches involved completing up to a 1 minute search around the radius of at least 75% of the Primary Browse Trees according to the SEPP 44 definition within the study area.

The Koala was not recorded during the surveys.

8 Conclusion

In summary, the Modification would require 2,216 'ecosystem credits' to be retired, which includes 21 ecosystem credits for indirect impacts. No 'species credits' are required for the Modification.

Whilst 22.3 ha of 'red flag' vegetation would be impacted, 21.5 ha of this is highly modified (being previously cropped and extensively grazed) and is considered to be in "poor" condition, despite not being in biobanking "low" condition. As the Modification is being assessed under Part 3A of the EP&A Act, the NSW Minister for Planning can grant an approval *whether or not a Biobanking Statement has been obtained and specify the number and class of biodiversity credits to be retired* (refer to Section 75JA of the EP&A Act Biobanking - Special Provisions).

The correct type and number of credits required to meet this offset requirement are available within the proposed Whitehaven Coal Regional Biobank Site for which an application to register the property as a Biobank Site will be made in 2010.

No Matters of National Environmental Significance under the EPBC Act have been recorded within ML 1579 during previous or current targeted surveys.

In relation to provisions of SEPP 44, while some potential Koala habitat occurs in the Modification area, no Koalas have been recorded in ML 1579 during previous or current targeted surveys.

9 References

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Glossary of Biobanking Terminology

The following glossary has been taken from the Biobanking Assessment Methodology and Operational Manual (DECC 2009a)

accredited assessor this is a person who has been accredited in accordance with s. 142B(1)(c) of the TSC Act to use the methodology and credit calculator.

adjacent remnant area The area of moderate to good condition native vegetation of which the biobank site or development site is a part which is linked ($\leq 100\text{m}$ for woody vegetation and $\leq 30\text{m}$ for non-woody vegetation) to the next area of native vegetation. Adjacent remnant area provides landscape context to the biobank or development site and may extend onto adjoining land.

assessment circle Circles of 100 ha and 1000 ha in which percent native vegetation cover in the landscape is assessed, taking into account both cover and condition of vegetation, for credit profiles and for Landscape Value score.

benchmarks (vegetation benchmarks) Quantitative measures of the range of variability in vegetation condition where there is relatively little evidence of modification by humans since European (post-1750) settlement. Benchmarks are defined for specified variables for vegetation communities. Vegetation with relatively little evidence of modification generally has minimal timber harvesting (few stumps, coppicing, cut logs), minimal firewood collection, minimal exotic weed cover, minimal grazing and trampling by introduced or overabundant native herbivores, minimal soil disturbance, minimal canopy dieback and no evidence of recent fire or flood. It is not subject to high-frequency burning and has evidence of recruitment of native species. Benchmarks are available by vegetation class (*sensu* Keith 2004) at <http://www.environment.nsw.gov.au/projects/BiometricTool.htm> and can also be obtained from reference sites or published sources.

biobanking agreement An agreement between the landowner and the Minister for Climate Change and the Environment (under Part 7A of the TSC Act) for the purpose of establishing a biobank site. The agreement states the management actions to be carried out to improve biodiversity values on the site and thereby create biodiversity credits under the scheme (s. 127D of the TSC Act).

biobank site Land designated by a biobanking agreement to be a biobank site. This term is also used in the Operational Manual for land that is being assessed as a biobank site

biobanking statement A statement issued under s. 127ZL of the TSC Act, specifying the number and class of credits to be retired for a particular development in accordance with the methodology. The statement may include other conditions to minimise the impact of the development on biodiversity values. If provided to consent or determining authority under the EP&A Act, the statement must be included as a condition of development consent or approval.

biodiversity credits Ecosystem or species credits required to offset the loss of biodiversity values on development sites or created on biobank sites from management actions that improve biodiversity values.

biodiversity values Include composition, structure and function of ecosystems, and include (but are not limited to) threatened species, populations and ecological communities and their habitats, as defined by the TSC Act, and exclude fish or marine vegetation, unless that fish or marine vegetation has been the subject of an order under s. 5A of the TSC Act.

cleared land Where the native over-storey has been cleared, there is no native mid-storey (or the native mid-storey has been cleared), and less than 50% of the ground cover vegetation is indigenous species or greater than 90% of the ground cover (dead or alive) is cleared.

CMA area The area of operation of a catchment management authority, as described in Schedule 2 of the *Catchment Management Authorities Act 2003*.

CMA sub-region Sub-regions of catchment management authority areas as set out in the Environmental Outcomes Assessment Methodology, Native Vegetation Regulation 2005.

connectivity A measure of the degree to which an area(s) of native vegetation is linked with other areas of vegetation.

Credit Calculator A computer program that applies the methodology and calculates the number and classes of credits required at a development site or created at a biobank site.

credit profile A description of the credit created or required in a vegetation zone or group of zones, according to the attributes of CMA sub-region, vegetation type, vegetation formation, surrounding vegetation cover, and patch size including low-condition vegetation.

critically endangered ecological community As defined in s. 4(1) of the TSXC Act and any additional critically endangered ecological communities listed under Part 13 of the EPBC Act.

development Includes development within the meaning of the *Environmental Planning and Assessment Act, 1979* and includes an activity within the meaning of Part 5 of that Act, and may also include projects under Part 3A of that Act.

ecosystem credits The class of biodiversity credits created or required for the impact on general biodiversity values and some threatened species, i.e. for biodiversity values except threatened species or populations that require species credits. Species that require ecosystem credits are listed in the Threatened Species Profile Database (TSPD).

endangered ecological community As defined in s. 4(1) of the TSXC Act and any additional endangered ecological communities listed under Part 13 of the EPBC Act. Endangered and critically endangered ecological communities are collectively referred to as EECs.

grassland Native vegetation classified in the vegetation formation Grasslands in *Ocean Shores to Desert Dunes: the Native Vegetation of New South Wales and the ACT* (Keith, D. 2004, Department of Environment and Conservation NSW, Hurstville NSW). Grasslands are generally dominated by large perennial tussock grasses, a lack of woody plants, the presence of broad-leaved herbs in inter-tussock spaces, and their ecological association with fertile, heavy clay soils on flat topography in regions with low to moderate rainfall.

habitat An area or areas occupied, or periodically or occasionally occupied, by a species, population or ecological community, including any biotic or abiotic component.

impact assessment The impact assessment that is referred to in s. 127ZK(3)(c) of the TSC Act and must be prepared in accordance with the methodology. The methodology requires the impact assessment to address the criteria used to justify an impact on a red flag area, the assessment of indirect impacts of the development, and the assessment of the direct impacts of the development.

individual A single, mature organism.

Landscape Value A measure of fragmentation, connectivity and adjacency of native vegetation at a site. Landscape Value comprises: (a) percent native vegetation cover in the 100-ha and 1000-ha assessment circles in which the development or biobank sites are located; (b) connectivity with surrounding vegetation; and (c) total adjacent remnant area.

low-condition vegetation Woody native vegetation with native over-storey percent foliage cover less than 25% of the lower value of the over-storey percent foliage cover benchmark for that vegetation type, and

- less than 50% of ground cover vegetation is indigenous species, or
- greater than 90% of ground cover vegetation is cleared.

Native grassland, wetland or herbfield where:

- less than 50% of ground cover vegetation is indigenous species, or
- more than 90% of ground cover vegetation is cleared.

If native vegetation is not in low condition, it is in moderate to good condition.

management zone Where the extent of development impact or improvement through management varies over a vegetation zone, a management zone is used for the purpose of calculating the change in Site Value for that vegetation zone.

Methodology means the Biobanking Assessment Methodology.

Mitchell Landscape Landscape with relatively homogeneous geomorphology, soils and broad vegetation types, mapped at a scale of 1:250 000.

moderate to good condition vegetation Native vegetation that is not in low condition.

native vegetation Vegetation described in section 6 of the NV Act. Native vegetation is used as a surrogate for general biodiversity values in the methodology.

Operational Manual Means the Biobanking Operational Manual, which provides guidance on how to use the credit calculator and undertake surveys.

patch size, including low-condition vegetation The area of moderate- to good- and low- condition native vegetation of which the biobank site or development site is a part which is linked to ($\leq 100\text{m}$ from for woody vegetation and $\leq 30\text{m}$ for non-woody vegetation) the next area of native vegetation. Patch size including low condition vegetation provides landscape context to the biobank or development site, and may extend onto adjoining land.

percent vegetation cover (percent native vegetation cover in the landscape, surrounding vegetation cover) The percentage of native vegetation cover in the 100-ha and 1000-ha assessment circles in which the vegetation zone is located. The percent native vegetation cover within the assessment circles is visually estimated from aerial or satellite imagery, taking into account both cover and condition of vegetation

plot An area in which some of the 10 site attributes that make up the Site Value score are assessed in a vegetation zone.

red flag area An area of land at the development site with high biodiversity conservation values where the impact of the development on biodiversity values cannot be offset by the retirement of biodiversity

credits in order to improve or maintain biodiversity values, unless the Director General determines that strict avoidance of the red flag area is unnecessary in the circumstances.

retirement of biodiversity credits A change in the status of a credit such that the credit can no longer be bought or sold. Retirement of credits may be required to comply with a biobanking statement or a direction issued by the Minister for Climate Change and the Environment, or they may be retired voluntarily.

site attributes Attributes used to assess Site Value and threatened species habitat. The 10 site attributes are native plant species richness, native over-storey cover, native mid-storey cover, native ground cover (grasses), native ground cover (shrubs), native ground cover (other), exotic plant cover (as a percentage of total ground and mid-storey cover), number of trees with hollows, proportion of over-storey species occurring as regeneration, and total length of fallen logs.

Site Value A quantitative measure of structural, compositional and functional condition of native vegetation, measured by site attributes.

species credits The class of biodiversity credits created or required for the impact on threatened species that cannot be reliably predicted to use an area of land based on habitat surrogates. Species that require species credits are listed in the Threatened Species Profile Database.

species polygon The actual area of habitat, or number of individuals of a threatened species, impacted by development at the development site or by management actions at the biobank site.

threatened population An endangered population as defined in s. 4(1) of the TSC Act.

threatened species Critically endangered, endangered or vulnerable threatened species and populations as defined in s. 4(1) of the TSC Act; or any additional threatened species listed under Part 13 of the EPBC Act as critically endangered, endangered or vulnerable.

threatened species sub-zone The area of vegetation that is assessed initially to determine which threatened species are assessed for biodiversity credits at a development site and a biobank site.

threatened species survey A targeted survey for a threatened species, undertaken in accordance with DECC guidelines to determine if the species is present.

transect A line or narrow belt along which environmental data is collected.

vegetation class Level of classification of vegetation communities defined in *Ocean Shores to Desert Dunes: the Native Vegetation of New South Wales and the ACT* (Keith, D. 2004, Department of Environment and Conservation NSW, Hurstville, NSW). There are 99 vegetation classes in NSW.

vegetation type The finest level of classification of native vegetation used in the methodology. Vegetation types are assigned to vegetation classes, which in turn are assigned to vegetation formations. There are approximately 1600 vegetation types within NSW.

Vegetation Types Database A database which contains the information on each vegetation type used in the methodology and comprises a description of each vegetation type, its class and formation, the CMA area within which the vegetation type occurs, the percent cleared value of the vegetation type, and the source of the information.

vegetation zone (zone) A relatively homogenous area in a proposal area (development or biobank site) that is of the same vegetation type and broad condition. A single zone must not contain a mix of vegetation in low condition and not in low condition. Zones with the same vegetation type and in moderate to good condition (i.e. not in low condition) can be combined within one ecosystem credit profile (as a sub-zone). A zone may comprise one or more discontinuous areas.

viability The ability of biodiversity values in an area to persist for many generations or long time periods.

wetland Native vegetation classified in the vegetation formation defined as Freshwater Wetland in *Ocean Shores to Desert Dunes: the Native Vegetation of New South Wales and the ACT* (Keith, D. 2004, Department of Environment and Conservation NSW, Hurstville, NSW).

zone see **vegetation zone**.

Appendix 1: Threatened Species Predicted On-site

Common Name	Scientific Name	Recorded On-site?
Australian Bustard	<i>Ardeotis australis</i>	Unlikely
Barking Owl	<i>Ninox connivens</i>	Likely
Black-chinned Honeyeater (eastern subspecies)	<i>Melithreptus gularis gularis</i>	Leard State Forest
Brown Treecreeper (eastern subspecies)	<i>Climacteris picumnus victoriae</i>	Yes (CES 2005)
Bush Stone-curlew	<i>Burhinus grallarius</i>	Possible
Diamond Firetail	<i>Stagonopleura guttata</i>	Leard State Forest
Eastern Cave Bat	<i>Vespadelus troughtoni</i>	Foraging
Eastern Pygmy-possum	<i>Cercartetus nanus</i>	Possible
Greater Long-eared Bat (south eastern form)	<i>Nyctophilus timoriensis</i>	Leard State Forest
Grey-crowned Babbler (eastern subspecies)	<i>Pomatostomus temporalis temporalis</i>	Yes (CES 2005)
Hooded Robin (south-eastern form)	<i>Melanodryas cucullata cucullata</i>	Yes (CES 2005)
Koala	<i>Phascolarctos cinereus</i>	Possible
Little Pied Bat	<i>Chalinolobus picatus</i>	Yes (CES 2005)
Masked Owl	<i>Tyto novaehollandiae</i>	Leard State Forest
Painted Honeyeater	<i>Grantiella picta</i>	Likely
Regent Honeyeater	<i>Anthochaera phrygia</i>	Possible foraging
Speckled Warbler	<i>Pyrrholaemus sagittatus</i>	Yes (CES 2005)
Spotted-tailed Quoll	<i>Dasyurus maculatus</i>	Possible
Squirrel Glider	<i>Petaurus norfolcensis</i>	Unlikely
Superb Parrot	<i>Polytelis swainsonii</i>	Possible
Swift Parrot	<i>Lathamus discolor</i>	Likely foraging
Turquoise Parrot	<i>Neophema pulchella</i>	Yes (CES 2005)
Yellow-bellied Sheathtail-bat	<i>Saccolaimus flaviventris</i>	Yes (CES 2005)
Glossy Black-cockatoo	<i>Calyptorhynchus lathami</i>	Yes (CES 2005)
Malleefowl	<i>Leipoa ocellata</i>	Unlikely

Appendix 2: EPBC Act Protected Matters Assessment

Summary of initial assessment to determine the likelihood of occurrence of threatened species, populations and ecological communities in the proposal site.

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the field survey and professional judgement. The terms for likelihood of occurrence are defined below:

- “Yes” = the species was or has been observed on the site.
- “Likely” = a medium to high probability that a species uses the site.
- “Potential” = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur.
- “Unlikely” = a very low to low probability that a species uses the site.
- “No” = habitat on-site and in the vicinity is unsuitable for the species.

Scientific Name	Common Name	Conservation Status ¹		Habitat Associations	Likelihood of Occurrence
		TSC Act	EPBC Act		
Endangered Ecological Communities					
-	Grassy White Box Woodland	EEC	EEC	The dominant tree species is generally White Box (<i>Eucalyptus albens</i>) and grass species dominate the ground layer. Major plant species in these woodlands include White Box and Blakely's Red Gum (<i>Eucalyptus blakelyi</i>), Yellow Box (<i>Eucalyptus melliodora</i>) and an associated understorey of native grasses including Kangaroo and Tussock grasses.	Yes – detected onsite
-	Natural grasslands on basalt and fine textured alluvial plains of northern NSW and sth Queensland		EEC		Not mapped on-site
-	Weeping Myall Woodlands	EEC	EEC		Not mapped on-site

Scientific Name	Common Name	Conservation Status ¹		Habitat Associations	Likelihood of Occurrence
		TSC Act	EPBC Act		
Threatened Flora					
<i>Cadellia pentastylis</i>	Ooline	V	V	Grows in thickets, west from near Tenterfield and north from Terry Hie Hie. NSW subdivisions: NT, NWS, NWP (Harden).	No – not recorded during field surveys
<i>Digitaria porrecta</i>	Finger Panic Grass	E	E	Native grassland, woodlands or open forest with a grassy understorey, on richer soils (NSW Department of Environment and Climate Change [DECC] 2007). Often found along roadsides and travelling stock routes where there is light grazing and occasional fire (DECC 2007).	No – not recorded during field surveys
<i>Diuris sheaffiana</i>	Tricolor Diuris	V	V	Grows in sclerophyll forest among grass, often with <i>Callitris</i> spp (Harden 1994). It is found in sandy soils, either on flats or small rises (DECC 2007). Also recorded from a red earth soil in a Bimble Box community in western NSW (DECC 2007). Soils include gritty orange-brown loam on granite, shallow red loamy sand on stony porphyry, skeletal lateritic soil and alluvial grey silty loam (DECC 2007). Flowers from September to November or generally spring (DECC 2007).	No – no suitable habitat
<i>Homopholis belsonii</i>		-	V	Grows in dry woodland on poor soils; north from the Warialda district. NSW subdivisions: NWS, NWP (Harden).	No – not recorded during field surveys
<i>Prasophyllum</i> sp. Wybong		-	E	Leek orchids are generally found in shrubby and grassy habitats in dry to wet soil, and <i>Prasophyllum</i> sp. Wybong is known to occur in open eucalypt woodland and grassland.	No – not recorded during field surveys
<i>Swainsona murrayana</i>	Slender Darling Pea	V	V	Often grows with <i>Maireana</i> species on heavy soils, especially in depressions (Harden 1994).	No – not recorded during field surveys
<i>Thesium australe</i>	Austral Toadflax	V	V	Occurs in grassland or grassy woodland. Often found in damp sites in association with Kangaroo Grass (<i>Themeda australis</i>) (DECC 2007). Flowers in spring–summer. Widespread but rare. NSW subdivisions: NC, CC, SC, NT, ST, NWS, CWS. Other Australian states: Qld, Tas.	No – no suitable habitat
<i>Tylophora linearis</i>		E	E	Found in the Barraba, Mendooran, Temora and West Wyalong districts in the northern and central western slopes of NSW. Grows in dry scrub and open forest. Recorded from low-altitude sedimentary flats in dry woodlands of <i>Eucalyptus fibrosa</i> , <i>Eucalyptus sideroxylon</i> , <i>Eucalyptus albens</i> , <i>Callitris endlicheri</i> , <i>Callitris glaucophylla</i> and <i>Allocasuarina luehmannii</i>	No – no suitable habitat
AMPHIBIANS					
<i>Litoria booroolongensis</i>	Booroolong Frog	E	-	Typically inhabits rocky western-flowing creeks and their headwaters, although a small number of animals have also been recorded in eastern-flowing streams (NSW Scientific Committee 2008).	No – no suitable habitat

Scientific Name	Common Name	Conservation Status ¹		Habitat Associations	Likelihood of Occurrence
		TSC Act	EPBC Act		
REPTILES					
<i>Underwoodisaurus sphyrurus</i>	Border Thick-tailed Gecko	V	V	Found only on the tablelands and slopes of northern NSW and southern Queensland, reaching south to Tamworth and west to Moree (DECC 2007). Most common in the granite country of the New England Tablelands (DECC 2007). Rocky hills with dry open eucalypt forest or woodland (DECC 2007). Favours forest and woodland areas with boulders, rock slabs, fallen timber and deep leaf litter (DECC 2007).	No – no suitable habitat
DIURNAL BIRDS					
<i>Lathamus discolor</i>	Swift Parrot	E	E	Breeds in Tasmania between September and January. Migrates to mainland in autumn, where it forages on profuse flowering Eucalypts (Blakers <i>et al.</i> 1984; Schodde and Tidemann 1986; Forshaw and Cooper 1981). Hence, in this region, autumn and winter flowering eucalypts are important for this species. Favoured feed trees include winter flowering species such as Swamp Mahogany (<i>Eucalyptus robusta</i>), Spotted Gum (<i>Corymbia maculata</i>), Red Bloodwood (<i>C. gummifera</i>), Mugga Ironbark (<i>E. sideroxylon</i>), and White Box (<i>E. albens</i>) (DECC 2007).	Potential
<i>Polytelis swainsonii</i>	Superb Parrot	V	V	The Superb Parrot is found throughout eastern inland NSW. On the South-western Slopes their core breeding area is roughly bounded by Cowra and Yass in the east, and Grenfell, Cootamundra and Coolac in the west. Birds breeding in this region are mainly absent during winter, when they migrate north to the region of the upper Namoi and Gwydir Rivers. The other main breeding sites are in the Riverina along the corridors of the Murray, Edward and Murrumbidgee Rivers where birds are present all year round. Inhabit box-gum woodland and Box-Gum, Box-Cypress-pine and Boree Woodlands and River Red Gum Forest foraging at or near the ground. Nest in hollows	Unlikely
<i>Rostratula benghalensis australis</i>	Painted Snipe (Australian subspecies)	E	E	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber (DECC 2007). Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (<i>ibid.</i>). Breeding is often in response to local conditions; generally occurs from September to December (DECC 2007). Roosts during the day in dense vegetation (NSW Scientific Committee 2004). Forages nocturnally on mud-flats and in shallow water (DECC 2007). Feeds on worms, molluscs, insects and some plant-matter (<i>ibid.</i>).	Unlikely

Scientific Name	Common Name	Conservation Status ¹		Habitat Associations	Likelihood of Occurrence
		TSC Act	EPBC Act		
DIURNAL BIRDS (CONTINUED)					
<i>Anthochaera phrygia</i>	Regent Honeyeater	E	E, M	Associated with temperate eucalypt woodland and open forest including forest edges, wooded farmland and urban areas with mature eucalypts, and riparian forests of River Oak (<i>Casuarina cunninghamiana</i>) (Garnett 1993). Areas containing Swamp Mahogany (<i>Eucalyptus robusta</i>) in coastal areas have been observed to be utilised (NPWS 1997). The Regent Honeyeater primarily feeds on nectar from box and ironbark eucalypts and occasionally from banksias and mistletoes (NPWS 1995). As such it is reliant on locally abundant nectar sources with different flowering times to provide reliable supply of nectar (Environment Australia 2000).	Potential
MAMMALS (EXCLUDING BATS)					
<i>Petrogale penicillata</i>	Brush-tailed Rock-wallaby	E	V	Rocky areas in a variety of habitats, typically north facing sites with numerous ledges, caves and crevices (Strahan 1995).	No – no suitable habitat
MAMMALS (BATS)					
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	The Large-eared Pied Bat has been recorded in a variety of habitats, including dry sclerophyll forests, woodland, sub-alpine woodland, edges of rainforests and wet sclerophyll forests (Churchill 1998; DECC 2007). This species roosts in caves, rock overhangs and disused mine shafts and as such is usually associated with rock outcrops and cliff faces (Churchill 1998; DECC 2007).	Unlikely
<i>Nyctophilus timoriensis</i>	Eastern Long-eared Bat	V	V	Preference for semi-arid areas, however, have been recorded in the high rainfall areas of south-western Australia (Churchill 1998). In South Australia this species has been associated with a range of mallee species, and found to the fringes of the treeless Nullarbor Plain (Duncan <i>et al.</i> 1999). In northern NSW, this species is thought to prefer structurally complex forest as foraging habitat, and breeding and sheltering is in tree hollows (Environment Australia 2000).	Unlikely
MIGRATORY TERRESTRIAL SPECIES LISTED UNDER EPBC ACT					
<i>Apus pacificus</i>	Fork-tailed Swift	-	M	Sometimes travels with Needletails. Varied habitat with a possible tendency to more arid areas but also over coasts and urban areas (Simpson and Day 1999).	Potential flyover

Scientific Name	Common Name	Conservation Status ¹		Habitat Associations	Likelihood of Occurrence
		TSC Act	EPBC Act		
MIGRATORY TERRESTRIAL SPECIES LISTED UNDER EPBC ACT (CONTINUED)					
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	-	M	Forages over large open fresh or saline waterbodies, coastal seas and open terrestrial areas (Marchant and Higgins 1993, Simpson and Day 1999). Breeding habitat consists of tall trees, mangroves, cliffs, rocky outcrops, silts, caves and crevices and is located along the coast or major rivers. Breeding habitat is usually in or close to water, but may occur up to a kilometre away (Marchant and Higgins 1993).	No – no suitable habitat
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	M	Forages aerially over a variety of habitats usually over coastal and mountain areas, most likely with a preference for wooded areas (Marchant and Higgins 1993; Simpson and Day 1999). Has been observed roosting in dense foliage of canopy trees, and may seek refuge in tree hollows in inclement weather (Marchant and Higgins 1993).	Unlikely
<i>Merops ornatus</i>	Rainbow Bee-eater	-	M	Resident in coastal and subcoastal northern Australia; regular breeding migrant in southern Australia, arriving September to October, departing February to March, some occasionally present April to May (Pizzey and Doyle 1988). Occurs in open country, chiefly at suitable breeding places in areas of sandy or loamy soil: sand-ridges, riverbanks, road-cuttings, sand-pits, occasionally coastal cliffs (<i>ibid.</i>). Nest is a chamber at the end of a burrow, up to 1.6 m long, tunnelled in flat or sloping ground, sandy back or cutting (<i>ibid.</i>).	Unlikely
MIGRATORY WETLAND SPECIES LISTED UNDER EPBC ACT					
<i>Ardea alba</i>	Great Egret	-	M	The Great Egret is common and widespread in Australia (McKilligan, 2005). It forages in a wide range of wet and dry habitats including permanent and ephemeral freshwaters, wet pasture and estuarine mangroves and mudflats (McKilligan, 2005).	Potential
<i>Ardea ibis</i>	Cattle Egret	-	M	Cattle Egrets forage on pasture, marsh, grassy road verges, rain puddles and croplands, but not usually in the open water of streams or lakes and they avoid marine environments (McKilligan, 2005). Some individuals stay close to the natal heronry from one nesting season to the next, but the majority leave the district in autumn and return the next spring. Cattle Egrets are likely to spend the winter dispersed along the coastal plain and only a small number have been recovered west of the Great Dividing Range (McKilligan, 2005).	Potential

Scientific Name	Common Name	Conservation Status ¹		Habitat Associations	Likelihood of Occurrence
		TSC Act	EPBC Act		
MIGRATORY WETLAND SPECIES LISTED UNDER EPBC ACT (CONTINUED)					
<i>Rostratula benghalensis s. lat.</i>	Painted Snipe	—	M	Prefers fringes of swamps, dams and nearby marshy areas where there is a cover of grasses, lignum, low scrub or open timber (DECC 2007). Nests on the ground amongst tall vegetation, such as grasses, tussocks or reeds (<i>ibid.</i>). Breeding is often in response to local conditions; generally occurs from September to December (DECC 2007). Roosts during the day in dense vegetation (NSW Scientific Committee 2004). Forages nocturnally on mud-flats and in shallow water (DECC 2007). Feeds on worms, molluscs, insects and some plant-matter (<i>ibid.</i>).	Unlikely

¹ Threatened species status listed under the NSW *Threatened Species Conservation Act, 1995* and the Commonwealth *Environment Protection and Biodiversity Conservation Act, 1999* as at 15 December 2009.

EEC = Endangered Ecological Community; E = Endangered; V = Vulnerable, M = Migratory.

Disclaimer: Data extracted from the Atlas of NSW Wildlife and EPBC Act Protected Matters Report are only indicative and cannot be considered a comprehensive inventory. Migratory marine species' and 'listed marine species' listed on the EPBC Act (and listed on the DEW protected matters report) have not been included in this table, since they are considered unlikely to occur within the study area due to the absence of marine habitat

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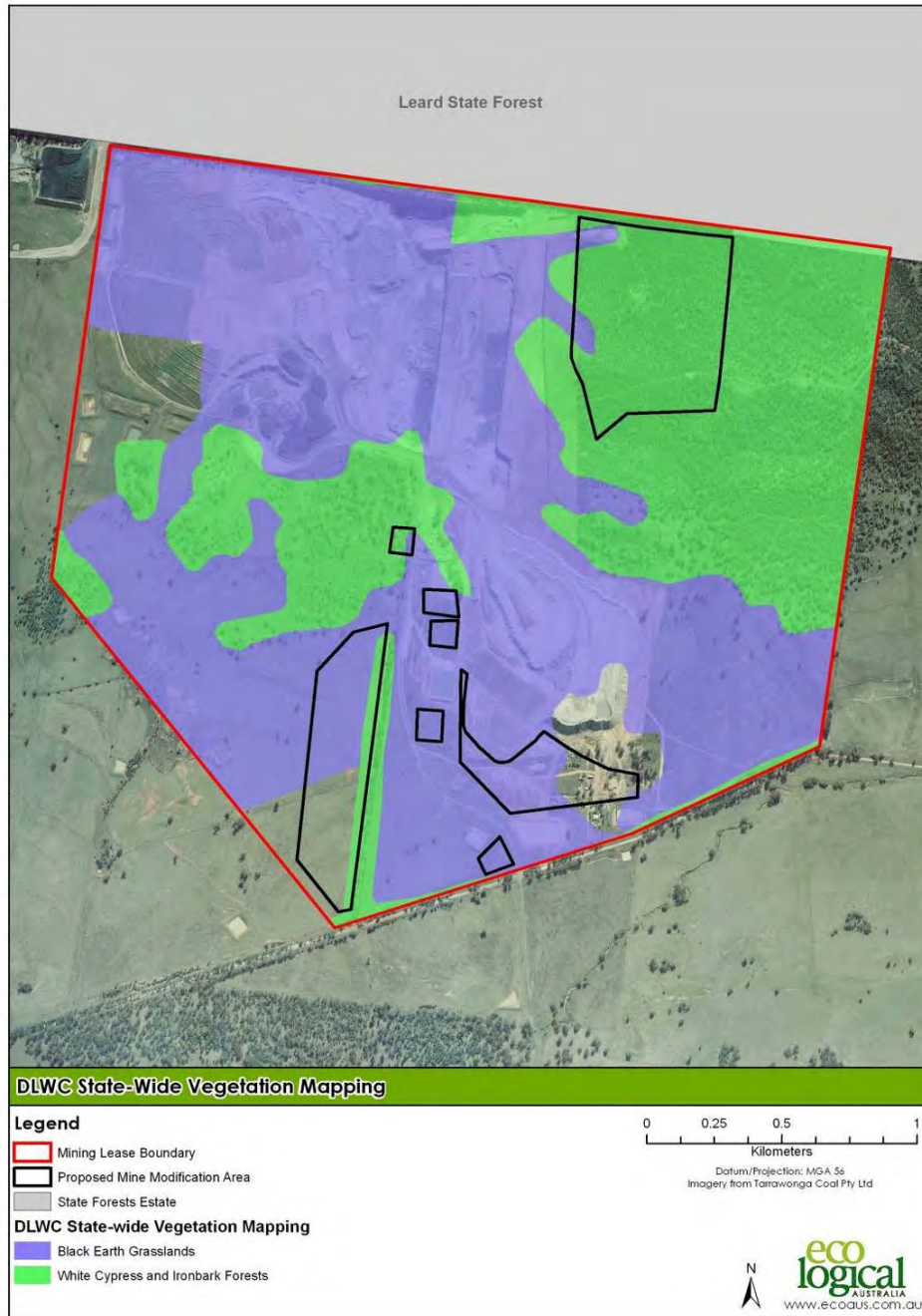
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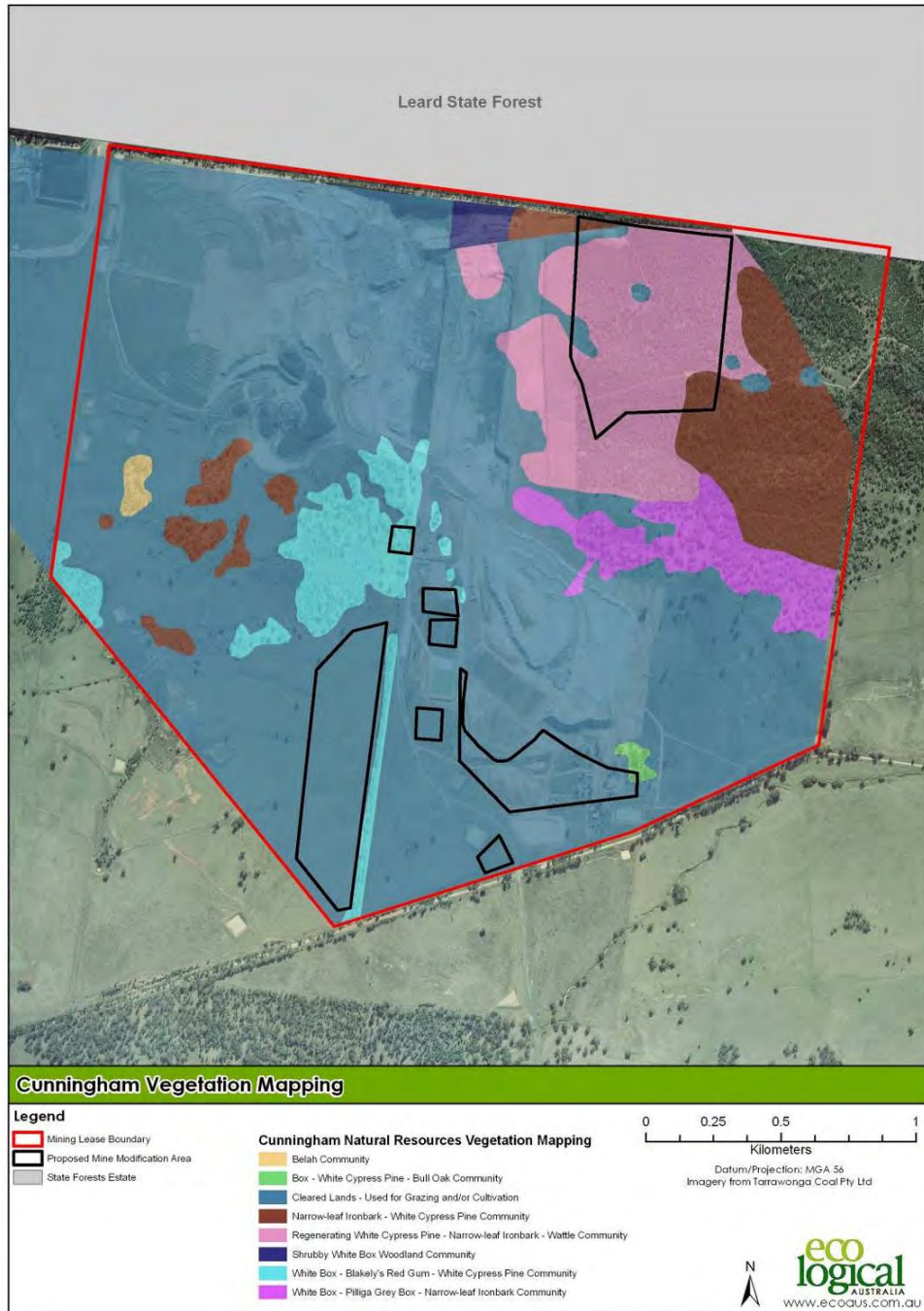
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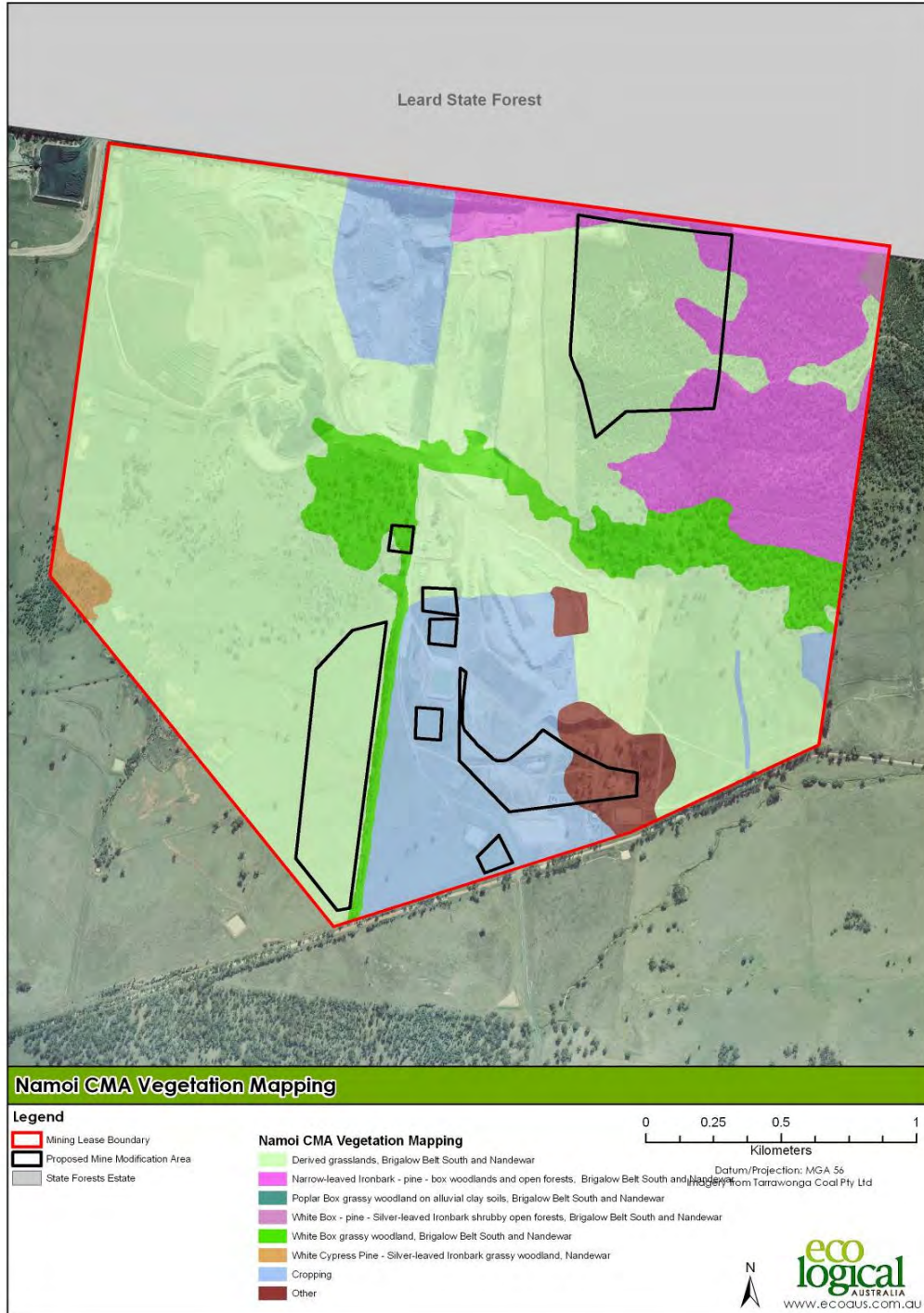
Appendix 3: DSNR State Boggabri 1:100,000 Map Sheet Native Vegetation Mapping (2006)



Appendix 4: GCNRC Vegetation Mapping (2005)



Appendix 5: Namoi CMA Vegetation Mapping



Appendix 6: Flora Species List

Eco Logical Australia (November and December 2009)

The following species list has been compiled from all species recorded in 38 biometric condition plots. It is not a complete flora list for the study area. The total number of native/exotic species recorded in each plot only includes those identified to species or genus level.

The number of native species used for the credit calculations (Appendix 8) includes all native species recorded in the plot whether or not they have been identified to species level.

Whilst only the plots used in the credit calculation are shown, the following tables include the species recorded in other plots within the same vegetation zone.

Family	Display Name	Common Name	Vegetation Zone									
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			
			Plot Number	1	3	4	5	9	12	21	22	23
Acanthaceae	<i>Brunoniella australis</i>	Blue Trumpet				x						
Acanthaceae	<i>Brunoniella pumilio</i>	Dwarf Blue Trumpet										
Acanthaceae	<i>Rostellularia adscendens</i>	-	x			x	x	x	x			
Adiantaceae	<i>Cheilanthes sieberi</i>	-	x	x	x	x	x		x	x	x	
Aizoaceae	<i>Carpobrotus glaucescens</i>	Pigface, Iceplant										
Aizoaceae	<i>Zaleya galericulata</i>	Hogweed										
Amaranthaceae	<i>Alternanthera</i> sp. A	-										

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Family	Display Name	Common Name	Vegetation Zone									
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			
			Plot Number	1	3	4	5	9	12	21	22	23
Anthericaceae	<i>Laxmannia gracilis</i>	Slender Wire Lily							x		x	x
Apocynaceae	<i>Carissa ovata</i>	Currant Bush				x						
Apocynaceae	<i>Parsonsia eucalyptophylla</i>	Gargaloo							x			
Asteraceae	<i>Calotis lappulacea</i>	Yellow Burr-daisy	x						x			
Asteraceae	* <i>Carthamus lanatus</i>	*Saffron Thistle										
Asteraceae	<i>Cassinia quinquefaria</i>	-										x
Asteraceae	* <i>Chondrilla juncea</i>	*Skeleton Weed										
Asteraceae	<i>Chrysocephalum apiculatum</i>	Common Everlasting, Yellow Buttons	x								x	
Asteraceae	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting							x		x	x
Asteraceae	<i>Glossocardia bidens</i>	Cobbler's Tack	x	x		x	x			x	x	x
Asteraceae	* <i>Lactuca saligna</i>	*Willow-leaved Lettuce										
Asteraceae	<i>Leiocarpa panaetioides</i>	Woolly Buttons										
Asteraceae	<i>Olearia elliptica</i>	Sticky Daisy-bush							x			
Asteraceae	<i>Vittadinia cuneata</i>	Fuzzweed	x	x	x	x				x		
Asteraceae	<i>Vittadinia muelleri</i>	-										
Asteraceae	<i>Xerochrysum bracteata</i>	Golden Everlasting										
Asteraceae	<i>Xerochrysum viscosa</i>	Sticky Everlasting							x			
Boraginaceae	<i>Cynoglossum australe</i>	-										
Boraginaceae	* <i>Echium plantagineum</i>	*Paterson's Curse										
Brassicaceae	* <i>Brassica</i> sp.	-										
Brassicaceae	* <i>Lepidium bonariense</i>	-										
Brassicaceae	<i>Lepidium</i> sp.	-										
Cactaceae	* <i>Cylindropuntia</i> sp.	-							x			
Cactaceae	* <i>Opuntia</i> sp.	-				x						

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Family	Display Name	Common Name	Vegetation Zone											
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest					
			Plot Number	1	3	4	5	9	12	21	22	23		
Campanulaceae	<i>Wahlenbergia</i> sp.1	-	x	x		x		x		x				
Campanulaceae	<i>Wahlenbergia</i> sp.2	-	x	x				x				x	x	
Caryophyllaceae	<i>*Petrorhagia nanteuilii</i>	-												
Chenopodiaceae	<i>Atriplex</i> sp	-								x				
Chenopodiaceae	<i>Chenopodium gaudichaudiana</i>	-	x							x				
Chenopodiaceae	<i>Einadia hastata</i>	Berry Saltbush								x				
Chenopodiaceae	<i>Einadia nutans</i>	Climbing Saltbush												
Chenopodiaceae	<i>Einadia</i> sp	-								x				
Chenopodiaceae	<i>Maireana microphylla</i>	Small-leaf Bluebush												
Chenopodiaceae	<i>Maireana</i> sp	-												
Chenopodiaceae	<i>Sclerolaena birchii</i>	Galvanized Burr												
Clusiaceae	<i>Hypericum gramineum</i>	Small St John's Wort		x					x			x		
Convolvulaceae	<i>Convolvulus erubescens</i>	Blushing Bindweed												
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed	x	x					x			x		
Cupressaceae	<i>Callitris endlicheri</i>	Black Cypress Pine										x		
Cupressaceae	<i>Callitris glaucophylla</i>	White Cypress Pine	x	x			x	x				x	x	x
Cupressaceae	<i>Callitris</i> sp	-			x									
Cyperaceae	<i>Carex inversa</i>	-	x							x				
Cyperaceae	<i>Cyperus gracilis</i>	Slender Flat-sedge	x	x			x					x	x	x
Dilleniaceae	<i>Hibbertia obtusifolia</i>	Hoary guinea flower							x			x		
Dilleniaceae	<i>Hibbertia riparia</i>	Erect Guinea-flower												
Euphorbiaceae	<i>Beyeria viscosa</i>	Pinkwood, Sticky wallaby Bush								x				
Euphorbiaceae	<i>Chamaesyce drummondii</i>	Caustic Weed												
Fabaceae - Faboideae	<i>Desmodium brachypodium</i>	Large Tick-trefoil	x	x			x	x				x	x	x

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

			Vegetation Zone									
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			
			Plot Number	1	3	4	5	9	12	21	22	23
Family	Display Name	Common Name										
Fabaceae - Faboideae	<i>Desmodium</i> sp	-			x							
Fabaceae - Faboideae	<i>Glycine tabacina</i>	-					x				x	
Fabaceae - Faboideae	<i>Glycine tomentella</i>	Woolly Glycine	x	x		x				x	x	x
Fabaceae - Faboideae	<i>Indigofera australis</i>	Australian Indigo										
Fabaceae - Faboideae	* <i>Medicago</i> sp	-										
Fabaceae - Faboideae	* <i>Trifolium arvense</i>	*Haresfoot Clover										
Fabaceae - Mimosoideae	<i>Acacia decora</i>	Western Golden Wattle	x	x		x	x			x	x	x
Fabaceae - Mimosoideae	<i>Acacia triptera</i>	Spurwing Wattle										
Gentianaceae	* <i>Centaurium</i> sp.	-										
Goodeniaceae	<i>Goodenia hederacea</i>	Ivy Goodenia	x	x		x	x			x	x	x
Juncaceae	<i>Juncus</i> sp.D1	-										
Juncaceae	<i>Juncus usitatus</i>	-										
Lamiaceae	<i>Oncinocalyx betchei</i>	-				x	x					
Lomandraceae	<i>Lomandra filiformis</i>	Wattle Matt-rush	x	x		x	x			x		
Lomandraceae	<i>Lomandra multiflora</i>	Many-flowered Mat-rush		x		x	x			x		
Lomandraceae	<i>Lomandra</i> sp	-			x							
Loranthaceae	<i>Amyema pendulum</i>	-										
Loranthaceae	<i>Amyema quandang</i>	-										
Malvaceae	<i>Abutilon oxycarpum</i>	Straggly Lantern-bush										
Malvaceae	* <i>Malva</i> sp	-										

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Family	Display Name	Common Name	Vegetation Zone									
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			
			Plot Number	1	3	4	5	9	12	21	22	23
Malvaceae	<i>Sida corrugata</i>	Corrugated Sida	x						x			
Malvaceae	<i>Sida cunninghamii</i>	Ridged Sida		x				x				
Malvaceae	* <i>Sida rhombifolia</i>	*Paddy's Lucerne										
Malvaceae	<i>Sida</i> sp	-										
Malvaceae	<i>Sida</i> sp. A	-				x				x		
Malvaceae	<i>Sida</i> sp. B	-								x		
Malvaceae	<i>Sida spinosa</i>	-				x	x					
Myoporaceae	<i>Eremophila debilis</i>	Amulla							x			
Myoporaceae	<i>Eremophila longifolia</i>	Emubush				x						x
Myoporaceae	<i>Eremophila mitchellii</i>	Budda										
Myoporaceae	<i>Myoporum montanum</i>	Western Boobialla										x
Myrtaceae	<i>Eucalyptus albens</i>	White Box										
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark		x		x	x					
Myrtaceae	<i>Eucalyptus pilligaensis</i>	Narrow-leaved Grey Box							x			
Nyctaginaceae	<i>Boerhavia dominii</i>	Tarvine	x	x		x				x	x	x
Oleaceae	<i>Jasminum lineare</i>	Desert Jasmine						x				
Oleaceae	<i>Notelaea microcarpa</i>	Native Olive				x						
Oleaceae	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>	Velvet Mock Olive		x								
Orchidaceae	<i>Cymbidium canaliculatum</i>	Tiger Orchid				x			x			
Oxalidaceae	<i>Oxalis perennans</i>	-		x						x		
Phormiaceae	<i>Dianella</i> sp.	-							x			
Phyllanthaceae	<i>Phyllanthus virgatus</i>	-	x	x				x		x		x
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	x	x	x	x	x			x	x	x
Poaceae	<i>Aristida vagans</i>	Threawn Speargrass										
Poaceae	<i>Austrodanthonia caespitosa</i>	Ringed Wallaby Grass			x							

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Family	Display Name	Common Name	Vegetation Zone										
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest				
			Plot Number	1	3	4	5	9	12	21	22	23	
Poaceae	<i>Austrodanthonia setacea</i>	Smallflower Wallaby Grass											
Poaceae	<i>Austrodanthonia</i> sp.	-											
Poaceae	<i>Austrostipa bigeniculata</i>	-							x				
Poaceae	<i>Austrostipa scabra</i>	Speargrass	x	x		x	x				x	x	x
Poaceae	<i>Austrostipa verticillata</i>	Slender Bamboo Grass			x								
Poaceae	* <i>Avena fatua</i>	*Wild Oats								x			
Poaceae	<i>Bothriochloa macra</i>	Red Grass											
Poaceae	* <i>Bromus catharticus</i>	*Prairie Grass											
Poaceae	* <i>Bromus hordeaceus</i>	*Soft Brome								x			
Poaceae	<i>Chloris truncata</i>	Windmill Grass											
Poaceae	<i>Chloris ventricosa</i>	Tall Chloris								x			
Poaceae	<i>Cymbopogon refractus</i>	Barbed Wire Grass	x	x		x	x				x	x	x
Poaceae	<i>Cynodon dactylon</i>	Common Couch											
Poaceae	<i>Dichanthium sericeum</i>	Queensland Bluegrass											
Poaceae	<i>Digitaria</i> sp. 1.	-											
Poaceae	<i>Digitaria</i> sp. 2	-											
Poaceae	<i>Elymus scaber</i>	-								x			
Poaceae	<i>Enneapogon nigricans</i>	Niggerheads	x	x		x	x				x	x	x
Poaceae	<i>Eragrostis brownii</i>	Brown's Lovegrass	x	x							x	x	x
Poaceae	* <i>Eragrostis curvula</i>	*African Lovegrass											
Poaceae	<i>Eragrostis</i> sp. 1	-						x					
Poaceae	<i>Eragrostis</i> sp. 2	-											
Poaceae	* <i>Lolium</i> sp	-											
Poaceae	<i>Panicum queenslandicum</i>	Yadbila Grass											
Poaceae	<i>Panicum</i> sp.	-									x		x

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

			Vegetation Zone								
			1: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest			2: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		3: White Cypress Pine - Narrow-leaved Ironbark	6: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest		
			Plot Number			1	3	4	5	9	12
Family	Display Name	Common Name	1	3	4	5	9	12	21	22	23
Poaceae	<i>Paspalidium constrictum</i>	Knottybutt Grass	x	x		x	x		x		
Poaceae	<i>Paspalidium</i> sp.	-									
Poaceae	* <i>Paspalum dilatatum</i>	*Paspalum									
Poaceae	<i>Sporobolus elongatus</i>	Slender Rat's Tail Grass									
Poaceae	<i>Sporobolus</i> sp.	-									
Poaceae	<i>Tragus australianus</i>	Small Burrgrass									
Poaceae	* <i>Vulpia muralis</i>	-									
Poaceae	* <i>Vulpia</i> sp.	-						x			
Polygonaceae	<i>Rumex brownii</i>	Swamp Dock						x	x		
Portulacaceae	<i>Portulaca oleracea</i>	Pigweed									
Ranunculaceae	<i>Clematis microphylla</i>	Small-leaved Clematis									
Rubiaceae	<i>Galium</i> sp.	-									
Rubiaceae	<i>Opercularia aspera</i>	Coarse Stinkweed									
Rutaceae	<i>Geijera parviflora</i>	Wilga				x					
Rutaceae	<i>Geijera salicifolia</i>	-									
Santalaceae	<i>Santalaceae</i> sp.	-									
Sapindaceae	<i>Alectryon oleifolius</i>	Western Rosewood, Bonaree									
Sapindaceae	<i>Dodonaea viscosa</i>	Sticky Hop-bush				x	x				x
Solanaceae	* <i>Lycium ferocissimum</i>	*African Boxthorn									
Solanaceae	<i>Solanum esuriale</i>	Quena									
Solanaceae	<i>Solanum</i> sp.	-									
Stackhousiaceae	<i>Stackhousia viminea</i>	Slender Stackhousia	x	x					x	x	
Thymelaeaceae	<i>Pimelea neo-anglica</i>	Poison Pimelea	x				x				x
Verbenaceae	* <i>Glandularia aristigera</i>	*Mayne's Pest		x				x			

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Vegetation Zone			4: White Box grassy woodland EEC				5: White Box grassy woodland EEC
Family	Display Name	Plot Name	13	14	15	16	19
		Common Name					
Acanthaceae	<i>Rostellularia adscendens</i>	-					x
Adiantaceae	<i>Cheilanthes sieberi</i>	-			x		
Aizoaceae	<i>Carpobrotus glaucescens</i>	Pigface, Iceplant					
Aizoaceae	<i>Zaleya galericulata</i>	Hogweed	x				
Amaranthaceae	<i>Alternanthera</i> species A	-					
Anthericaceae	<i>Laxmannia gracilis</i>	Slender Wire Lily					x
Apocynaceae	<i>Carissa ovata</i>	Currant Bush					
Apocynaceae	<i>Parsonsia eucalyptophylla</i>	Gargaloo					
Asteraceae	<i>Calotis lappulacea</i>	Yellow Burr-daisy	x	x	x	x	
Asteraceae	* <i>Carthamus lanatus</i>	*Saffron Thistle					
Asteraceae	<i>Cassinia quinquefaria</i>	-					
Asteraceae	* <i>Chondrilla juncea</i>	*Skeleton Weed	x	x		x	x
Asteraceae	<i>Chrysocephalum apiculatum</i>	Common Everlasting, Yellow Buttons					
Asteraceae	<i>Chrysocephalum semipapposum</i>	Clustered Everlasting					x
Asteraceae	<i>Glossocardia bidens</i>	Cobbler's Tack					
Asteraceae	* <i>Lactuca saligna</i>	*Willow-leaved Lettuce					
Asteraceae	<i>Leptorhynchus panaetioides</i>	Wooly Buttons					
Asteraceae	<i>Olearia elliptica</i>	Sticky Daisy-bush	x	x	x	x	x
Asteraceae	<i>Vittadinia cuneata</i>	Fuzzweed	x	x	x	x	
Asteraceae	<i>Vittadinia muelleri</i>	Fuzzweed					
Asteraceae	<i>Bracteantha bracteata</i>	Golden Everlasting					
Asteraceae	<i>Xerochrysum viscosa</i>	Sticky Everlasting	x				x
Boraginaceae	<i>Cynoglossum australe</i>	-					
Boraginaceae	* <i>Echium plantagineum</i>	*Paterson's Curse					

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Vegetation Zone			4: White Box grassy woodland EEC				5: White Box grassy woodland EEC
Brassicaceae	* <i>Brassica</i> sp.	-	x	x	x	x	x
Brassicaceae	* <i>Lepidium bonariense</i>	*Argentine Peppergrass					
Brassicaceae	<i>Lepidium</i> sp.	-					
Cactaceae	* <i>Cylindropuntia</i> spp.	-					x
Cactaceae	* <i>Opuntia</i> spp.	-					
Campanulaceae	<i>Wahlenbergia</i> sp.1	-					x
Campanulaceae	<i>Wahlenbergia</i> sp.2	-					
Campanulaceae	<i>Wahlenbergia</i> spp.	-					
Caryophyllaceae	* <i>Petrorhagia nanteuilii</i>						
Chenopodiaceae	<i>Atriplex</i> spp.	-					
Chenopodiaceae	<i>Chenopodium gaudichaudiana</i>	-		x	x	x	x
Chenopodiaceae	<i>Einadia hastata</i>	Berry Saltbush	x	x	x	x	x
Chenopodiaceae	<i>Einadia nutans</i>	Climbing Saltbush					
Chenopodiaceae	<i>Einadia</i> spp.	-	x	x			x
Chenopodiaceae	<i>Maireana microphylla</i>	-					
Chenopodiaceae	<i>Maireana</i> spp.	-					
Chenopodiaceae	<i>Sclerolaena birchii</i>	Galvanized Burr					
Clusiaceae	<i>Hypericum gramineum</i>	Small St John's Wort	x	x			
Convolvulaceae	<i>Convolvulus erubescens</i>	Blushing Bindweed	x	x	x	x	x
Convolvulaceae	<i>Dichondra repens</i>	Kidney Weed					
Cupressaceae	<i>Callitris endlicheri</i>	Black Cypress Pine	x	x			
Cupressaceae	<i>Callitris glaucophylla</i>	White Cypress Pine					
Cupressaceae	<i>Callitris</i> spp.	-					
Cyperaceae	<i>Carex inversa</i>	Knob Sedge					
Cyperaceae	<i>Cyperus gracilis</i>	Slender Flat-sedge					
Dilleniaceae	<i>Hibbertia obtusifolia</i>	Hoary guinea flower					
Dilleniaceae	<i>Hibbertia riparia</i>	-					

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Vegetation Zone			4: White Box grassy woodland EEC				5: White Box grassy woodland EEC
Euphorbiaceae	<i>Beyeria viscosa</i>	Pinkwood, Sticky wallaby Bush			x	x	
Euphorbiaceae	<i>Chamaesyce drummondii</i>	Caustic Weed					
Fabaceae – Faboideae	<i>Desmodium brachypodum</i>	Large Tick-trefoil					
Fabaceae – Faboideae	<i>Desmodium</i> spp.	-					x
Fabaceae – Faboideae	<i>Glycine tabacina</i>	Glycine					
Fabaceae – Faboideae	<i>Glycine tomentella</i>	Woolly Glycine					
Fabaceae – Faboideae	<i>Indigofera australis</i>	Australian Indigo	x	x		x	x
Fabaceae – Faboideae	* <i>Medicago</i> sp.	-	x	x	x		
Fabaceae – Faboideae	* <i>Trifolium arvense</i>	*Haresfoot Clover					
Fabaceae – Faboideae	<i>Acacia decora</i>	Western Golden Wattle					
Fabaceae – Faboideae	<i>Acacia triptera</i>	Spurwing Wattle					
Gentianiaceae	* <i>Centaurium</i> sp.	-					
Goodeniaceae	<i>Goodenia hederacea</i>	Ivy Goodenia				x	
Juncaceae	<i>Juncus</i> sp.D1	-					
Juncaceae	<i>Juncus usitatus</i>	-					
Verbenaceae	<i>Oncinocalyx betchei</i>	-					
Lomandraceae	<i>Lomandra filiformis</i>	Wattle Matt-rush					
Lomandraceae	<i>Lomandra multiflora</i>	Many-flowered Mat-rush					
Lomandraceae	<i>Lomandra</i> spp.	-					
Loranthaceae	<i>Amyema pendulum</i>	-					
Loranthaceae	<i>Amyema quandang</i>	-					
Malvaceae	<i>Abutilon oxycarpum</i>	Straggly Lantern Bush					
Malvaceae	* <i>Malva</i> sp.	-					x
Malvaceae	<i>Sida corrugata</i>	Corrugated Sida		x			x
Malvaceae	<i>Sida cunninghamii</i>	-					
Malvaceae	* <i>Sida rhombifolia</i>	*Paddy's Lucerne*					

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Vegetation Zone			4: White Box grassy woodland EEC				5: White Box grassy woodland EEC
Malvaceae	<i>Sida</i> sp. 1	-	x		x	x	
Malvaceae	<i>Sida</i> sp. 2	-					
Malvaceae	<i>Sida</i> sp. 3	-					x
Malvaceae	<i>Sida spinosa</i>	-					x
Myoporaceae	<i>Eremophila debilis</i>	Amulla					
Myoporaceae	<i>Eremophila longifolia</i>	Emubush					
Myoporaceae	<i>Eremophila mitchellii</i>	Budda					
Myoporaceae	<i>Myoporum montanum</i>	Western Boobialla	x				x
Myrtaceae	<i>Eucalyptus albens</i>	White Box					
Myrtaceae	<i>Eucalyptus crebra</i>	Narrow-leaved Ironbark					
Myrtaceae	<i>Eucalyptus pilligaensis</i>	Narrow-leaved Grey Box	x				x
Nyctaginaceae	<i>Boerhavia dominii</i>	Tarvine					
Oleaceae	<i>Jasminum lineare</i>	Desert Jasmine					
Oleaceae	<i>Notelaea microcarpa</i>	Native Olive					
Oleaceae	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>	-					
Orchidaceae	<i>Cymbidium canaliculatum</i>	Tiger Orchid					x
Oxalidaceae	<i>Oxalis perennans</i>	-					
Phormiaceae	<i>Dianella</i> sp.	-		x	x	x	
Euphorbiaceae	<i>Phyllanthus virgatus</i>	-					
Poaceae	<i>Aristida ramosa</i>	Purple Wiregrass	x				
Poaceae	<i>Aristida vagans</i>	Threeawn Speargrass					
Poaceae	<i>Austrodanthonia caespitosa</i>	Ringed Wallaby Grass	x			x	
Poaceae	<i>Austrodanthonia setacea</i>	-					
Poaceae	<i>Austrodanthonia</i> sp.	-					
Poaceae	<i>Austrostipa bigeniculata</i>	-	x	x		x	x
Poaceae	<i>Austrostipa scabra</i>	Speargrass	x	x			x

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Vegetation Zone			4: White Box grassy woodland EEC				5: White Box grassy woodland EEC
Poaceae	<i>Austrostipa verticillata</i>	Slender Bamboo Grass	x			x	
Poaceae	* <i>Avena fatua</i>	*Wild Oats	x	x		x	x
Poaceae	<i>Bothriochloa macra</i>	Red Grass					
Poaceae	* <i>Bromus catharticus</i>	*Prairie Grass	x				
Poaceae	* <i>Bromus hordeaceus</i>	*Soft Brome	x	x	x	x	x
Poaceae	<i>Chloris truncata</i>	Windmill Grass					
Poaceae	<i>Chloris ventricosa</i>	Tall Chloris					
Poaceae	<i>Cymbopogon refractus</i>	Barbed Wire Grass	x	x	x		
Poaceae	<i>Cynodon dactylon</i> *	Common Couch					
Poaceae	<i>Dichanthium sericeum</i>	Queensland Bluegrass	x	x			x
Poaceae	<i>Digitaria</i> sp.	-					
Poaceae	<i>Digitaria</i> sp. 2	-					
Poaceae	<i>Elymus scaber</i>	-	x	x			x
Poaceae	<i>Enneapogon nigricans</i>	Niggerheads	x				
Poaceae	<i>Eragrostis brownii</i>	Brown's Lovegrass					x
Poaceae	* <i>Eragrostis curvula</i>	*African Lovegrass		x			x
Poaceae	<i>Eragrostis</i> sp.	-					
Poaceae	<i>Eragrostis</i> spp.	-	x		x		
Poaceae	* <i>Lolium</i> spp.	-					
Poaceae	<i>Panicum queenslandicum</i>	Yadbila Grass					
Poaceae	<i>Panicum</i> spp.	-	x			x	
Poaceae	<i>Paspalidium constrictum</i>	Knottybutt Grass					
Poaceae	<i>Paspalidium</i> spp.	-			x		
Poaceae	* <i>Paspalum dilatatum</i>	*Paspalum	x		x	x	
Poaceae	<i>Sporobolus elongatus</i>	Slender Rat's Tail Grass					
Poaceae	<i>Sporobolus</i> spp.	-		x			
Poaceae	<i>Tragus australianus</i>	Small Burrgrass					
Poaceae	* <i>Vulpia muralis</i>	-					

TARRAWONGA COAL MINE MODIFICATION- BIOBANKING ASSESSMENT

Vegetation Zone			4: White Box grassy woodland EEC				5: White Box grassy woodland EEC
Poaceae	* <i>Vulpia</i> sp.	-					
Polygonaceae	<i>Rumex brownii</i>	Swamp Dock		x		x	
Portulacaceae	<i>Portulaca oleracea</i>	Pigweed					
Ranunculaceae	<i>Clematis microphylla</i>	Small-leaved Clematis					
Rubiaceae	<i>Galium</i> spp.	-		x			
Rubiaceae	<i>Opercularia aspera</i>	Coarse Stinkweed					x
Rutaceae	<i>Geijera parviflora</i>	Wilga					
Rutaceae	<i>Geijera salicifolia</i>	Brush Wilga					
Santalaceae	<i>Santalaceae</i> sp.	-					
Sapindaceae	<i>Alectryon oleifolius</i>	Western Rosewood, Bonaree					
Sapindaceae	<i>Dodonaea viscosa</i>	Sticky Hop-bush					x
Solanaceae	* <i>Lycium ferocissimum</i>	*African Boxthorn					
Solanaceae	<i>Solanum esuriale</i>	Quena					
Solanaceae	<i>Solanum</i> sp.	-					
Stackhousiaceae	<i>Stackhousia viminea</i>	Slender Stackhousia					
Thymelaeaceae	<i>Pimelea neo-anglica</i>	Poison Pimelea	x		x	x	x
Verbenaceae	* <i>Glandularia aristigera</i>	*Mayne's Pest					x
Total Number of Native Understorey Species Present in each Quadrat of the Vegetation Zone (excluding grasses)			8	9	6	8	11
Total Number of "Important" Species Present (red shading) in Vegetation Zone			4	5	1	3	5
Meets EPBC Act definition of EEC			No				Yes

Appendix 7: Combined Threatened Flora and Fauna Survey Effort

Group	Target Species or Type	Status under TSC Act	Status under EPBC Act	DECC (2004) Threatened Biodiversity Survey and Assessment Guidelines (Appropriate Survey Options)	Survey Required for Biobanking Assessment	BioBanking Survey Months	Previous Survey Effort in Mine Lease Area (GCNRC & CES 2005)	Previous Survey Effort in impact site	Previous Survey Season/months/year	Biobanking Survey Effort (ELA 2009)	Biobanking Survey Effort in impact site	Biobanking Survey Season	Compliance with Guidelines								
													BioBanking Requirements	DECC TBSA (& EPBC Act)							
Flora	<i>Philotheca ericifolia</i>	V	V	1x100m traverse per stratification unit <2 hectares; 2x100m traverses per 2-50 hectares of stratification unit; 3x100m traverses per 51-250 hectares of stratification unit OR Plot Based Quadrat Surveys	Yes	All year	70 plots & unknown targeted search transects	6 plots & unknown targeted search transects	Feb, April & Sept	40 hours traversing & 38 20 x 20m plots	14 hours traversing & 14 plots	November & December	Yes	Yes							
	<i>Pomaderris queenslandica</i> (Scant Pomaderris)	E			Yes	All year							Yes	Yes							
	<i>Thesium australe</i> (Austral Toadflax)	V	V		Yes	Sept - Feb							Yes	Yes							
	<i>Cyperus conicus</i>	E			Yes	All year							Yes	Yes							
	<i>Dichanthium setosum</i> (Bluegrass)	V	V		Yes	Dec - May							Yes	Yes							
	<i>Digitaria porrecta</i> (Finger Panic Grass)	E	E		Yes	Dec - May							Yes	Yes							
Terrestrial Mammals	<i>Aepyprymnus rufescens</i> (Rufous Bettong)	V		Yes	All year	4 trap lines (200 trap nights each)	2 trap lines (200 trap nights each)	Feb, April & July					Yes	Yes							
															Pitfall traps - 24 trap nights over 3-4 consecutive nights for each stratification unit up to 50 ha, plus an additional effort for every additional 100 hectares.	4 pitfall trap lines	Nil in impact area	Feb, April & July			
															Hair tubes - 10 large and 10 small tubes in pairs for at least 4 days and 4 nights per stratification unit up to 50 hectares, plus an additional effort for every additional 100 hectares.	20 hair trap sites (2 traps, 10 nights)	1 hair trap site (2 traps, 10 nights)	Feb, April & July			
															Spotlighting - 1 hour walking at approximately 1km per hour on 2 separate nights per stratification unit up to 50 hectares, plus an additional effort for every additional 100 hectares.	Approximately 8 km spotlighting	Approximately 150m spotlighting in impact site	Feb, April & July	8 hours spotlighting	2 hours spotlighting	December
															Search for scats and signs – 30 minutes searching each relevant habitat, including trees for scratch marks per stratification unit up to 50 hectares, plus an additional effort for every additional 100 hectares.	Search for scats and signs	Search for scats and signs	Feb, April & July	8 hours habitat search	2 hours habitat search	December
															Collection of predator scats – Opportunistic collection for hair analysis.	Collection of Predator Scats	Collection of Predator Scats	Feb, April & July			
Microchiropteran Bats	<i>Vespadelus troughtoni</i> (Eastern Cave Bat) - Breeding Habitat only	V		Harp traps - Four trap nights over two consecutive nights per 100 hectares of stratification unit in October to March.	Yes	All year	3 trap nights	2 trap nights	Feb, April & July	No Breeding habitat (caves)	No Breeding habitat (caves)		Yes	Yes							
	<i>Chalinolobus dwyeri</i> (Large-eared Pied Bat) - Breeding Habitat only	V	V	Anabats - Two Anabats utilised for the entire night (a minimum of four hours), starting at dusk for two nights per 100 hectares of stratification unit in October to March.	Yes	Sept - May	Anabat used while spotlighting (approx. 8 km) & at 1 fixed location (duration unknown)	Anabat used while spotlighting (approx. 150m in impact site)	Feb, April & July	No Breeding habitat (caves)	No Breeding habitat (caves)		Yes	Yes							

Group	Target Species or Type	Status under TSC Act	Status under EPBC Act	DECC (2004) Threatened Biodiversity Survey and Assessment Guidelines (Appropriate Survey Options)	Survey Required for Biobanking Assessment	BioBanking Survey Months	Previous Survey Effort in Mine Lease Area (GCNRC & CES 2005)	Previous Survey Effort in impact site	Previous Survey Season/months/year	Biobanking Survey Effort (ELA 2009)	Biobanking Survey Effort in impact site	Biobanking Survey Season	Compliance with Guidelines		
													BioBanking Requirements	DECC TBSA (& EPBC Act)	
	<i>Nyctophilus timoriensis</i> (Greater Long-eared Bat - South-eastern form)	V	V	Mist netting - One trap set for at least two hours starting at dusk, for two nights per 100 hectares of stratification unit in October to March.	No	NA							NA	Yes	
	<i>Saccolaimus flaviventris</i> (Yellow-bellied Sheath-tail-bat)	V			No	NA								NA	Yes
Diurnal Birds	<i>Falco hypoleucos</i> (Grey Falcon)	V			Yes	All year	Morning bird surveys along 4 trap lines	Morning bird surveys along 2 trap lines	Feb, April & July	8 hours habitat search	2 hours habitat search	December	Yes	Yes	
	<i>Lophoictinia isura</i> (Square-tailed Kite)	V		Wetland census – 1 hour census at dawn or dusk for each wetland.	Yes	Sept - Mar							Yes	Yes	
	<i>Melithreptus gularis gularis</i> (Black-chinned Honeyeater - eastern subspecies)	V		Water source 20 minute census at dawn or dusk for each watercourse	No	NA							NA	Yes	
	<i>Climacteris picumnus</i> (Brown Treecreeper)	V			No	NA							NA	Yes	
	<i>Stagonopleura guttata</i> (Diamond Firetail)	V			No	NA							NA	Yes	
	<i>Pomatostomus temporalis</i> (Grey-crowned Babbler - eastern subspecies)	V			No	NA							NA	Yes	
	<i>Glossopsitta pusilla</i> (Little Lorikeet)	V			No	NA							NA	Yes	
	<i>Grantiella picta</i> (Painted Honeyeater)	V			No	NA							NA	Yes	
	<i>Chthonicola sagittata</i> (Speckled Warbler)	V			No	NA							NA	Yes	
	<i>Neophema pulchella</i> (Turquoise Parrot)	V			No	NA							NA	Yes	
	<i>Lathamus discolor</i> (Swift Parrot)	E	E		No	NA							NA	Yes	
	<i>Xanthomyza phrygia</i> (Regent Honeyeater)	E	E		No	NA							NA	Yes	
	<i>Apus pacificus</i> (Fork-tailed Swift)		M		No	NA							NA	Yes	
	<i>Ardea alba</i> (Great Egret)		M		No	NA							NA	Yes	
	<i>Ardea ibis</i> (Cattle Egret)		M		No	NA							NA	Yes	
Nocturnal Birds	<i>Tyto novaehollandiae</i> (Masked Owl)	V		Call playback - Sites should be separated by 800 metres – 1km, and each site must have the playback session repeated as follows: at least 5 visits per site, on different nights are required for the Barking Owl; and 8 visits per site for the Masked Owl.	No	NA	6 call playback stations (Barking Owl, Masked Owl, Powerful Owl & Bush Stone-curlew) over 4 nights	1 call playback station (Barking Owl, Masked Owl, Powerful Owl & Bush Stone-curlew) over 4 nights	Feb, April & July				NA	Yes	
	<i>Ninox connivens</i> (Barking Owl)	V		Day habitat search - Search habitat for pellets and likely hollows. Stag-watching - Observing potential roost hollows for 30mins prior to sunset and 60mins following sunset.	No	NA							NA	Yes	

Group	Target Species or Type	Status under TSC Act	Status under EPBC Act	DECC (2004) Threatened Biodiversity Survey and Assessment Guidelines (Appropriate Survey Options)	Survey Required for Biobanking Assessment	BioBanking Survey Months	Previous Survey Effort in Mine Lease Area (GCNRC & CES 2005)	Previous Survey Effort in impact site	Previous Survey Season/months/year	Biobanking Survey Effort (ELA 2009)	Biobanking Survey Effort in impact site	Biobanking Survey Season	Compliance with Guidelines	
													BioBanking Requirements	DECC TBSA (& EPBC Act)
Reptiles	<i>Underwoodisaurus sphyrurus</i> (Border Thick-tailed Gecko)	V	V	Habitat Search – 30-minute search on two separate days targeting specific habitat per stratification unit up to 200 hectares west of the ranges.	Yes	All year	8 hours microhabitat searches in Veg Zones 1,6 and lease area	Searches in leaf litter, along the drainage lines and under rocks and logs	Feb, April & July	8 hours habitat search	2 hours habitat search	December	Yes	Yes
	<i>Hoplocephalus bitorquatus</i> (Pale-headed Snake)	V		Pitfall traps with drift nets – 24 trap nights over 4 consecutive nights per stratification unit up to 200 hectares west of the ranges.	Yes	Oct - Apr	4 pitfall trap lines	Nil in impact area	Feb, April & July				Yes	Yes
				Spotlighting/ nocturnal search – 30 minute search on 2 separate nights in specific habitat per stratification unit up to 200 hectares west of the ranges.			Approximately 8 km spotlighting	Approximately 150m spotlighting in impact site	Feb, April & July	8 hours spotlighting	2 hours spotlighting	December		

E = Endangered V = Vulnerable M = Migratory DECCW TBSA = Department of Environment, Climate Change and Water

Appendix 8: Plots

Vegetation Zone: 1

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: Moderate/Good (M/G) Ancillary Code: Moderately advanced regrowth

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
1	29	39.5	28	20	8	26	0	0	1	61	229045	6607850	56
3	29	46	12	22	0	14	0	0	1	50	228847	6607558	56
4	18	6.5	4	30	10	8	0	0	1	7	229122	6607755	56

Vegetation Zone: 2

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: M/G Ancillary Code: Advanced regrowth

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
5	33	38	24.5	26	0	18	0	0	1	36	229217	6607425	56
9	30	20.5	16	36	8	18	0	0	1	72	229143	6607380	56

Vegetation Zone: 3

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: M/G Ancillary Code: Derived Grassland with scattered trees and shrubs

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
12	27	0	0	8	32	8	24	0	1	24	228719	6607646	56

Vegetation Zone: 4

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Grassy White Box community Derived Grassland - continued grazing

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
13	20	0	0	40	0	22	18	0	1	0	227845	6606367	56
14	21	0	0	30	0	22	22	0	1	0	227900	6606106	56
15	10	0	0	28	0	14	22	0	1	0	227840	6605842	56
16	16	0	0	30	0	20	20	0	1	0	227815	6605648	56

Vegetation Zone: 5

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Grassy White Box community

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
19	29	12.5	4.5	26	8	8	6	0	1	26	228039	6606903	56

Vegetation Zone: 6

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: M/G Ancillary Code: Locked Cypress Pine regrowth

Plot Name	NPS	NOS	NMS	NGCG	NGCS	NGCO	EPC	NTH	OR	FL	Longitude	Latitude	Zone
21	32	34	25	36	0	26	0	0	1	94	228965	6607426	56
22	21	36	0	28	0	14	0	0	1	12	228764	6607933	56
23	23	34	16	22	0	10	0	0	1	28	228820	6607367	56

NPS = native plant species; NOS = native over-storey cover; NMS = native mid-storey cover; NGCS = native ground cover (grasses); NGCS = native ground cover (shrubs); NGCO = native ground cover (other); EPC = exotic plant cover; NTH = number of trees with hollows; OR = overstorey regeneration; FL = total length of fallen logs.

Appendix 9: Opportunistic Fauna Species List

Scientific Name	Common Name
Birds	
<i>Struthidea cinerea</i>	Apostlebird
<i>Alisterus scapularis</i>	Australian King-Parrot
<i>Gymnorhina tibicen</i>	Australian Magpie
<i>Barnardius zonarius</i>	Australian Ringneck
<i>Coracina novaehollandiae</i>	Black-faced Cuckoo-shrike
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern sub-species)
<i>Acanthiza reguloides</i>	Buff-rumped Thornbill
<i>Anas castanea</i>	Chestnut Teal
<i>Phaps chalcoptera</i>	Common Bronzewing
<i>Ocyphaps lophotes</i>	Crested Pigeon
<i>Taeniopygia bichenovii</i>	Double-barred Finch
<i>Artamus cyanopterus</i>	Dusky Woodswallow
<i>Platycercus adscitus eximius</i>	Eastern Rosella
<i>Eolophus roseicapillus</i>	Galah
<i>Rhipidura albiscapa</i>	Grey Fantail
<i>Myiagra rubecula</i>	Leaden Flycatcher
<i>Grallina cyanoleuca</i>	Magpie-lark
<i>Manorina melanocephala</i>	Noisy Miner
<i>Oriolus sagittatus</i>	Olive-backed Oriole
<i>Geopelia placida</i>	Peaceful Dove
<i>Strepera graculina</i>	Pied Currawong
<i>Psephotus haematonotus</i>	Red-rumped Parrot
<i>Anthus australis</i>	Richard's Pipit
<i>Charadrius hiaticula</i>	Ringed Plover
<i>Pachycephala rufiventris</i>	Rufous Whistler
<i>Todiramphus sanctus</i>	Sacred Kingfisher
<i>Pyrrholaemus sagittatus</i>	Speckled Warbler
<i>Malurus cyaneus</i>	Superb Fairy-wren
<i>Corvus orru</i>	Torresian Crow
<i>Neophema pulchella</i>	Turquoise Parrot
<i>Aquila audax</i>	Wedge-tailed Eagle
<i>Lichenostomus penicillatus</i>	White-plumed Honeyeater
<i>Rhipidura leucophrys</i>	Willie Wagtail

Appendix 9: Opportunistic Fauna Species List (Continued)

Scientific Name	Common Name
Mammals	
<i>Lepus capensis</i>	Brown Hare*
<i>Macropus giganteus</i>	Eastern Grey Kangaroo
<i>Vulpes vulpes</i>	Fox*
<i>Wallabia bicolor</i>	Swamp Wallaby
Reptiles	
<i>Pogona barbata</i>	Bearded Dragon
<i>Tiliqua scincoides</i>	Eastern Blue-tongue
<i>Strophurus intermedius</i>	Southern Spiny-tailed Gecko

Source: Eco Logical Australia (this study) .

* - denotes exotic species

Appendix 10: Site Value Scores

Vegetation Zone: 1

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: Moderate/Good (M/G) Ancillary Code: Moderately advanced regrowth

Site Attribute	Current Score	Score for Total Clearing	Score for Rehabilitation
Native plant species richness	2	0	1
Native over-storey cover	3	0	1
Native mid-storey cover	3	0	1
Native ground cover (grasses)	3	0	1
Native ground cover (shrubs)	3	0	1
Native ground cover (other)	0	0	0
Exotic plant cover	3	0	0
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	3	0	0
Site Value	65	0	14

Vegetation Zone: 2

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: M/G Ancillary Code: Advanced regrowth

Site Attribute	Current Score	Score for Total Clearing	Score for Rehabilitation
Native plant species richness	3	0	1
Native over-storey cover	3	0	1
Native mid-storey cover	3	0	1
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	3	0	1
Native ground cover (other)	0	0	0
Exotic plant cover	3	0	0
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	3	0	0
Site Value	72	0	14

Vegetation Zone: 3

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: M/G Ancillary Code: Derived Grassland with scattered trees and shrubs

Site Attribute	Current Score	Score for Total Clearing	Score for Rehabilitation
Native plant species richness	2	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	0	0	1
Native ground cover (grasses)	1	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	1	0	1
Exotic plant cover	1	0	0
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	3	0	0
Site Value	29	0	9

Vegetation Zone: 4

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Grassy White Box community Derived Grassland - continued grazing

Site Attribute	Current Score	Score for Total Clearing	Score for Rehabilitation
Native plant species richness	2	0	1
Native over-storey cover	0	0	0
Native mid-storey cover	3	0	1
Native ground cover (grasses)	3	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	0	0	0
Exotic plant cover	2	0	0
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	0	0	0
Site Value	36	0	11

Vegetation Zone: 5

Vegetation Type: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Condition: M/G Ancillary Code: Grassy White Box community

Site Attribute	Current Score	Score for Total Clearing	Score for Rehabilitation
Native plant species richness	3	0	1
Native over-storey cover	3	0	1
Native mid-storey cover	3	0	1
Native ground cover (grasses)	2	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	1	0	1
Exotic plant cover	2	0	0
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	2	0	0
Site Value	60	0	14

Vegetation Zone: 6

Vegetation Type: White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Condition: M/G Ancillary Code: Locked Cypress Pine regrowth

Site Attribute	Current Score	Score for Total Clearing	Score for Rehabilitation
Native plant species richness	2	0	1
Native over-storey cover	3	0	1
Native mid-storey cover	3	0	1
Native ground cover (grasses)	3	0	1
Native ground cover (shrubs)	0	0	0
Native ground cover (other)	0	0	0
Exotic plant cover	3	0	0
Number of trees with hollows	0	0	0
Over-storey regeneration	3	0	1
Total length of fallen logs	3	0	0
Site Value	60	0	13

Appendix 11: Credit Report (Total Clearing)



Biobanking Credit Report

This report identifies the number and type of credits required at a DEVELOPMENT SITE.

Date of report: 04/02/2010 Time: 08:31 Tool Version: 1.1

Development Details

Proposal ID: 0032/2010/D001

Development Name: Proposed Tarrawonga Mine Modification

Development Location: Tarrawonga Coal Mine is located approximately 15 kilometres (km) north-east

Development Address: Total Clearing- FINAL

Lot: 11	Section:	DP: 754940
Lot: 15	Section:	DP: 754940
Lot: 16	Section:	DP: 754940
Lot: 25	Section:	DP: 754940
Lot: 26	Section:	DP: 754940
Lot: 29	Section:	DP: 754940

CMA: Namoi

Proponent Name: Tarrawonga Coal Pty Ltd

Proponent Address: PO Box 600 Gunnedah NSW 2380

Proponent Phone: 02 6743 4000

Assessor Name: Darren James

Assessor Address: PO Box 12 Sutherland NSW 1499

Assessor Phone: 02 8536 8618

Assessor Accreditation Number: 0032

The following information is required to be submitted with this BioBanking Statement (where ticked)

- Local reference data is required for the following vegetation zones
- An Expert Report for the following species
- The minimum number of plots were not entered for the following vegetation zones



Improving or maintaining biodiversity values

The proposal has 1 or more Red Flag areas, as listed below:

Red Flag	Reason
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Vegetation type being > 70% cleared; Vegetation type contains an endangered ecological community;

The development does not improve or maintain biodiversity values and a biobanking statement cannot be issued.



Ecosystem Credits

Vegetation Type	Area (ha)	Credits Required	Red Flag
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions [NA226]	0.8	41	No
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions [NA226]	21.5	798	Yes
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	2.6	173	No
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	1.8	47	No
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	14.1	772	No
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	18.3	1,199	No

Credit Profiles

Group: 1 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 41 credits

Total area of vegetation(s): 0.8 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 25 ha

3. CMA subregion & vegetation types

Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Central West

CMA Sub-Region(s)	Veg Type(s)
Pilliga	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (CW215)

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A)	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)
Liverpool Plains (Part B)	



Group: 2 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 798 credits

Total area of vegetation(s): 21.5 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 25 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Central West

CMA Sub-Region(s)	Veg Type(s)
Pilliga	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (CW215)

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A) Liverpool Plains (Part B)	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)

Group: 3 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 173 credits

Total area of vegetation(s): 2.64 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A) Liverpool Plains (Part B)	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)



Group: 4 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 47 credits

Total area of vegetation(s): 1.8 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A) Liverpool Plains (Part B)	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)

Group: 5 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 772 credits

Total area of vegetation(s): 14.1 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A) Liverpool Plains (Part B)	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)

Group: 6 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 1,199 credits

Total area of vegetation(s): 18.3 ha



1. Surrounding vegetation cover	2. Patch size, including low condition
<p>Description: Minimum surrounding vegetation cover in which the credits must be obtained.</p> <p>Minimum percent cover: 10%</p>	<p>Description: Minimum area of contiguous vegetation in which credits must be obtained.</p> <p>Minimum area: 100 ha</p>

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)

Liverpool Plains (Part A)
Liverpool Plains (Part B)

Veg Type(s)

White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)

Species Credits



Appendix 12: Credit Report (Rehabilitation)



Biobanking Credit Report

This report identifies the number and type of credits required at a DEVELOPMENT SITE.

Date of report: 04/02/2010 Time: 08:23 Tool Version: 1.1

Development Details

Proposal ID: 0032/2010/D002

Development Name: Proposed Tarrawonga Mine Modification

Development Location: Tarrawonga Coal Mine is located approximately 15 kilometres (km) north-east of Gunnedah

Development Address: Rehabilitation- FINAL

Lot: 11	Section:	DP: 754940
Lot: 15	Section:	DP: 754940
Lot: 16	Section:	DP: 754940
Lot: 25	Section:	DP: 754940
Lot: 26	Section:	DP: 754940
Lot: 29	Section:	DP: 754940

CMA: Namoi

Proponent Name: Tarrawonga Coal Pty Ltd

Proponent Address: PO Box 600 Gunnedah NSW 2380

Proponent Phone: 02 6743 4000

Assessor Name: Darren James

Assessor Address: PO Box 12 Sutherland NSW 1499

Assessor Phone: 02 8536 8618

Assessor Accreditation Number: 0032

The following information is required to be submitted with this BioBanking Statement (where ticked)

- Local reference data is required for the following vegetation zones
- An Expert Report for the following species
- The minimum number of plots were not entered for the following vegetation zones



Improving or maintaining biodiversity values

The proposal has 1 or more Red Flag areas, as listed below:

Red Flag	Reason
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Vegetation type being > 70% cleared; Vegetation type contains an endangered ecological community;

The development does not improve or maintain biodiversity values and a biobanking statement cannot be issued.



Ecosystem Credits

Vegetation Type	Area (ha)	Credits Required	Red Flag
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions [NA226]	0.8	29	No
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions [NA226]	21.5	563	Yes
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	2.6	125	No
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	1.8	40	No
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	14.1	568	No
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	18.3	870	No

Credit Profiles

Group: 1 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 29 credits

Total area of vegetation(s): 0.8 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 25 ha

3. CMA subregion & vegetation types

Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Central West

CMA Sub-Region(s)	Veg Type(s)
Pilliga	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (CW215)

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A)	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)
Liverpool Plains (Part B)	



Group: 2 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 563 credits

Total area of vegetation(s): 21.5 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 25 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Central West

CMA Sub-Region(s)	Veg Type(s)
Pilliga	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (CW215)

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A) Liverpool Plains (Part B)	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)

Group: 3 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 125 credits

Total area of vegetation(s): 2.64 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A) Liverpool Plains (Part B)	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)



Group: 4 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 40 credits

Total area of vegetation(s): 1.8 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types

Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A)	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)
Liverpool Plains (Part B)	

Group: 5 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 568 credits

Total area of vegetation(s): 14.1 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types

Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A)	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)
Liverpool Plains (Part B)	

Group: 6 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 870 credits

Total area of vegetation(s): 18.3 ha



1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained. Minimum percent cover: 10%	Description: Minimum area of contiguous vegetation in which credits must be obtained. Minimum area: 100 ha

3. CMA subregion & vegetation types
Credits must be obtained in any one or more of the following CMA Sub-regions and vegetation types:

Namoi

CMA Sub-Region(s)

Liverpool Plains (Part A)
Liverpool Plains (Part B)

Veg Type(s)

White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)

Species Credits



Appendix 13: Comparison of Threatened Species Predicted in White Cypress Pine – Ironbark vegetation in the Liverpool Plain and Peel sub-regions

Tarrawonga Species List	Regional Offset Species List (Liverpool Plains Part B Sub-region)	Regional Offset Species List (Peel Sub-region)
Barking Owl	Barking Owl	Barking Owl
Black-chinned Honeyeater (eastern subspecies)	Black-chinned Honeyeater (eastern subspecies)	Black-chinned Honeyeater (eastern subspecies)
Brown Treecreeper (eastern subspecies)	Brown Treecreeper (eastern subspecies)	Brown Treecreeper (eastern subspecies)
Diamond Firetail	Diamond Firetail	Diamond Firetail
Eastern Cave Bat	Eastern Cave Bat	
Glossy Black-cockatoo	Glossy Black-cockatoo	Glossy Black-cockatoo
Greater Long-eared Bat (south eastern form)	Greater Long-eared Bat (south eastern form)	Greater Long-eared Bat (south eastern form)
Grey-crowned Babbler (eastern subspecies)	Grey-crowned Babbler (eastern subspecies)	Grey-crowned Babbler (eastern subspecies)
Hooded Robin (south-eastern form)	Hooded Robin (south-eastern form)	Hooded Robin (south-eastern form)
Koala	Koala	Koala
Little Pied Bat	Little Pied Bat	
Malleefowl	Malleefowl	
Masked Owl	Masked Owl	Masked Owl
Painted Honeyeater	Painted Honeyeater	Painted Honeyeater
Regent Honeyeater	Regent Honeyeater	Regent Honeyeater
Speckled Warbler	Speckled Warbler	Speckled Warbler
Spotted-tailed Quoll	Spotted-tailed Quoll	Spotted-tailed Quoll
Squirrel Glider	Squirrel Glider	Squirrel Glider
Swift Parrot	Swift Parrot	Swift Parrot
Turquoise Parrot	Turquoise Parrot	Turquoise Parrot
Yellow-bellied Sheath-tail-bat	Yellow-bellied Sheath-tail-bat	Yellow-bellied Sheath-tail-bat

Appendix 14: SEPP 44 Koala Habitat Protection

Potential Koala Habitat Assessment

The identification of an area of land as SEPP 44 Potential Koala Habitat is determined by the presence of Schedule 2 Koala feed tree species, as listed under SEPP44: Koala Habitat Protection (refer to Table 1).

Potential Koala Habitat is defined as areas where the tree species listed under Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component. An area of land to which the policy applies must be at least one hectare in area (and may include adjoining land in the same ownership).

Table 1: SEPP 44 Schedule 2 Primary Browse Trees

Scientific Name	Common Name
<i>Eucalyptus albens</i>	White Box
<i>Eucalyptus camaldulensis</i>	River Red Gum
<i>Eucalyptus haemastoma</i>	Broad-leaved Scribbly Gum
<i>Eucalyptus microcorys</i>	Tallowwood
<i>Eucalyptus populnea</i>	Bimble Box
<i>Eucalyptus punctata</i>	Grey Gum
<i>Eucalyptus robusta</i>	Swamp Mahogany
<i>Eucalyptus signata</i>	Scribbly Gum
<i>Eucalyptus tereticornis</i>	Forest Red Gum
<i>Eucalyptus viminalis</i>	Ribbon Gum

Browse trees recorded on site highlighted in green.

SEPP44 Schedule 2 Primary Browse Trees occurring within the study area included *Eucalyptus albens* (White Box) and *Eucalyptus populnea* (Poplar Box). These species represented at least 15% of the canopy in Vegetation Zones 3, 10 and 11 and are therefore considered to qualify as Potential Koala Habitat and a Core Koala Habitat Assessment is required.

Core Koala Habitat Assessment

According to SEPP44 Koala Habitat Protection definition, for an area of land to be regarded as Core Koala Habitat, evidence must demonstrate that the land contains:

- a resident population of Koalas, evidenced by attributes such as breeding females (that is, females with young); and
- recent sightings of and historical records of a population.

Surveys targeting the Koala comprised spotlighting, play-back of male calls and targeted scat searches. Spotlighting transects and call play-back was undertaken on the night of the 7th and 8th of December, with a total of eight person hours of nocturnal surveys over two separate nights (see Figure 9 for location of spotlight transects). Koala scat searches involved completing up to a 1min search around the radius of at least 75% of the Primary Browse Trees according to SEPP44 definition within the study area.

Surveys targeting the Koala did not result in the detection of physical or secondary (ie scat) evidence of a resident population within the study area. Local records of Koala occur approximately 10km to the northwest and just under 15km to the southeast of the study area, suggesting that a low density population of the species exists in the locality. Based on this evidence, the study area is not considered to contain Core Koala Habitat.



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