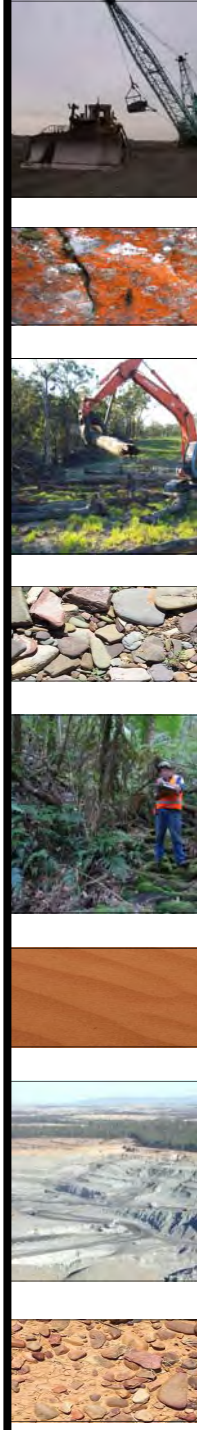
Biodiversity Offset Strategy (ELA 2010)



APPENDIX L

Rocglen Coal Mine Extension Project

Biodiversity Offset Strategy

Prepared for
GSS Environmental on behalf of Whitehaven Coal Limited

November 2010

DOCUMENT TRACKING

ITEM	DETAIL
Project Name	Rocglen Coal Mine Extension Project - Biodiversity Offset Strategy
Project Number	10SUTENV-0024
File location	G:\Synergy\Projects\10SUTENV\10SUTENV-0024 Rocglen Mine Modification Biodiversity Offset Strategy Review
Prepared by	Martin Sullivan
Approved by	Robert Humphries
Status	Final
Version Number	1
Last saved on	November 2010
Cover photo	Clockwise from top – Pilliga Box – Poplar Box – White Cypress Pine Grassy Woodland, Derived Native Grassland, *Swainsona galegifolia* (Smooth Darling Pea), Overburden emplacement area. Photos by MS.

This report should be cited as 'Eco Logical Australia 2010. *Rocglen Coal Mine - Biodiversity Offset Strategy*. Prepared for GSS Environmental on behalf of Whitehaven Coal Limited.

ACKNOWLEDGEMENTS

This document has been prepared by Eco Logical Australia Pty Ltd with support from Eryn Bath (GSS Environmental) and Danny Young (Whitehaven Coal Limited).

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Abbreviations

ABBREVIATION	DESCRIPTION
BOS	Biodiversity Offset Strategy
CEEC	Critically Endangered Ecological community
CMA	Catchment Management Authority
DECC	Department of Environment & Climate Change (now DECCW)
DECCW	Department of Environment and Climate Change
DNG	Derived Native Grassland
DOP	NSW Department of Planning
DSEWPC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
EA Report	Environmental Assessment Report
EEC	Endangered Ecological Community
ELA	Eco Logical Australia Pty Ltd
EP&A Act	*Environmental Planning and Assessment Act 1979*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
LGA	*Local Government Area*
TSC Act	*Threatened Species Conservation Act 1995*

Executive Summary

Eco Logical Australia (ELA) was commissioned by Whitehaven Coal Limited to prepare a Biodiversity Offset Strategy (BOS) that meets the offset requirements for an approval under the *Environmental Planning and Assessment Act* 1979 (EPA Act) and the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) for the Rocglen Coal Mine Extension Project (the 'project').

This BOS accompanies the Environmental Assessment report (EA Report) prepared by GSS Environmental (2010a) and the Flora and Fauna Assessment Report prepared by RPS Harpers Somers O'Sullivan (RPS 2010).

The direct and indirect impacts to threatened species, populations and ecological communities and their habitats resulting from the proposed Rocglen Coal Mine Extension Project are documented in the Flora and Fauna Assessment Report prepared by RPS (2010).

The project proposes to 'clear' all remaining vegetation within the project site except for a small area of Poplar Box Grassy Woodland in the north western corner and a roughly square 30 ha area which forms the north eastern section of the project site (including 47.9 ha of the 111.3 ha of the previously approved Biodiversity Offset areas). While not all vegetation within the impact footprint is likely to be cleared, the offset assessment has been undertaken on the assumption that all vegetation shown on Figure 6 will be cleared to allow more flexibility to site, if required, associated infrastructure such as roads and stockpiles in peripheral areas of the project boundary. Thus offset strategy thereby provides for the complete loss of all vegetation remaining within the project site regardless of whether these impacts occur.

The total direct and impacts of the project include 95.44 ha of vegetation which consists of 47.04 ha of intact vegetation in moderate to good condition and 48.4 ha of derived native grassland in moderate condition.

In relation to the EPBC Act listed White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland CEEC, the proposal will directly impact on 5.9 ha of intact remnants made up of 7 patches, each less than 1 ha in area along Wean Road and Jaeger Lane and 10.9 ha of DNG in long narrow bands between approved stock piles on the eastern boundary of the project site.

Indicative Biobanking Assessments were undertaken to inform an Improve or Maintain outcome including a Biobank Site Assessment for the replacement of the 47.9 ha of the original offset areas (requiring 478 biodiversity credits) and a Impact Site Assessment for the proposed impact area of 95.44 ha (requiring 4,381 credits). The offset strategy thus address a cumulative impact of 110 ha comprising 95.44 ha of impacts for mine extension and the equivalent of 15 ha of the original impacts which the 47.9 ha of impacts to the approved offset area represents and now needs to be replaced.

The offset strategy proposed to retire a combined total of 4,859 credits from the Whitehaven Regional Biobank Site which is in the final stages of registration by the Department of Environment, Climate Change and Water as detailed in Table 12.

In summary, the proposed Biodiversity Offset Strategy compensates for the direct loss of 95.44 ha of vegetation in various condition states (intact and DNG) and replacement offsets for impacts to 47.9 ha of the 131.74 ha of approved offsets on a 'like for like' basis with the equivalent of over 525 ha of

vegetation in the Whitehaven Regional Biobank Site. The Biodiversity Offset Strategy provides an offset (525 ha) to impact (110.44) ratio of 4.75:1.

The proposed Biodiversity Offset Strategy meets the specific principles of offsets in NSW, particularly principles 6 and 10. Key components of the offset package include:

- The vegetation at the Whitehaven Regional Biobank Site is of equal or greater conservation status to the project site;
- The offset area is almost 5 times the size of the cumulative area to be impacted at the project site (proposed mine extension impacts of 95.44 ha and replacement offset for impacts to 47.9 ha of the 111.3 ha of the original offsets provided for the original mine approval);
- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks (via a registered Biobanking Agreement that is currently being assessed by DECCW);
- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking management plan with in-perpetuity management costs held in Trust; and
- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional Offset Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated.

The offset package also meets the draft Commonwealth offset principles in that:-

- the offset package is a direct package that is targeted to the EPBC Act matters that are being impacted and determined to be a controlled action are on a like for like basis:
    - 784 White Box – Yellow Box –Blakely's Red Gum grassy woodland and derived native grassland biodiversity credits (equivalent to 75 ha of the CEEC are being retired to offset impacts to 5.9 ha of intact White Box along Wean Road and Jaeger Lane and 10.9 ha of derived native grassland within the mine site boundary), an offset ratio of 4.46:1;
    - an additional 618 White Box credits, equivalent to 59.4 ha is being protected to offset impacts to other non EPBC Act listed vegetation communities, i.e. a total area of 134.4 ha of White Box – Yellow Box –Blakely's Red Gum grassy woodland and derived native grassland will be protected which is of an equivalent condition to that being impacted.
    - 525 ha of habitat suitable foraging habitat for the Regent Honeyeater and Swift Parrot will also be protected to replace the loss of 47.04 ha of suitable foraging habitat (intact woodland remnants) as a result of the mine extension and for the replacement for impacts to the original offset areas which provided offsets for approximately 15 ha of the original impacts, a ratio of 8.5:1.
- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks (via a registered Biobanking Agreement on title that is currently being assessed by DECCW);

- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking management plan with in-perpetuity management costs held in Trust;
- The offset area is less than 1 km to the east of the mine site and is therefore in the same general area as the development activity;
- The offset is enforceable and will be monitored and audited in accordance with the Biobank Agreement; and
- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional Offset Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated.

1 Introduction

Eco Logical Australia (ELA) was commissioned by Whitehaven Coal Limited to prepare a Biodiversity Offset Strategy (BOS) that meets the offset requirements for an approval under the *Environmental Planning and Assessment Act* 1979 (EPA Act) and the *Environment Protection and Biodiversity Conservation Act* 1999 (EPBC Act) for the Rocglen Coal Mine Extension Project (the 'project').

Rocglen Coal Mine is located on Wean Road approximately 25 km north of Gunnedah and 23 km south-east of Boggabri in the Gunnedah Coalfields of NSW (Figure 1 and Figure 2). It is within the Gunnedah Local Government Area (LGA) and the Liverpool Plains (Part B) subregion of the Namoi Catchment Management Authority Area (CMA).

This BOS accompanies the Environmental Assessment report (EA Report) prepared by GSS Environmental (2010a) and the Flora and Fauna Assessment Report prepared by RPS Harpers Somers O'Sullivan (RPS 2010).

1.1 PROJECT HISTORY

1.1.1 Belmont Coal Project (PA 06_198)

The project was originally approved under the title "Belmont Coal Project" by the Department of Planning (under delegation to the Minister for Planning) on 15 April 2008.

The original Part 3A Major Project application for the "Belmont Coal Project" (PA 06_0198) stated that:

> *The proposal involves constructing and operating an open cut coal mine and associated facilities, and includes:*
>
> - *extracting coal by open cut mining methods at a maximum rate of 1.5 million tonnes a year;*
> - *crushing and screening coal on-site;*
> - *transporting it by road to the Whitehaven Coal Handling and Preparation Plant at Gunnedah;*
> - *constructing mining-related infrastructure on the site;*
> - *transporting coal by rail to the Port of Newcastle; and*
> - *rehabilitating the mine site.*

The project approval includes two conditions (Condition 27 and 28) of Schedule 3 of PA 06_0198, regarding the preparation and implementation of a Biodiversity Offset Strategy:

> ***"Condition 27:** The Proponent shall:*
>
> *a) implement the Biodiversity Offsets summarised in Table 8 and described in the EA (shown conceptually in Figure 6 in Appendix 4); and*
> *b) make suitable arrangements to provide appropriate long term security for the offset areas by the end of August 2010, to the satisfaction of the Director-General.*

	Offset Area	*Minimum Size*
1	*"Glenroc" remnant Ironbark – Pilliga Grey Box vegetation*	*42.3 ha*
2	*Northern boundary of the project site*	*2.6 ha*
3	*Jaeger Lane*	*2.6 ha*
4	*Southern boundary of the project site*	*3.8 ha*
5	*Whitehaven Regional Biodiversity Offset Area*	*60 ha (see condition 28)*

Table 8: Biodiversity Offsets

***Condition 28**: The Proponent is to allocate at least 60 ha of the required offset from the Whitehaven Regional Biodiversity Offset area (offset 5 in Table 8 - also refer to Appendix 5). This must be done in consultation with DECC, and to the satisfaction of the Director-General."*

1.1.2 Modification to PA 06_198

A modification to the project approval (PA 06_0198) was approved by the Department of Planning (under delegation to the Minister for Planning) on 27 May 2010. The project modification included the following components (GSS Environmental 2010b):

- *Widening the face of the open cut, outside of the currently approved limit, to establish a highwall within competent material that will enable development of the pit in a safe and efficient manner; and*
- *Extraction of the additional overburden material from the fault zone and emplacement of it within the current area of disturbance to the north and east of the proposed stabilisation works.*

While additional areas of disturbed land were to be impacted by the modification, no additional impacts to threatened species or ecological communities were identified. All approved infrastructure (including the open cut mine, overburden emplacement areas, soil stockpiles, site office and facilities, roads and dams) up to and including this project modification is represented graphically in Figure 3: of this report.

1.1.3 Rocglen Coal Extension Project (PA 10_0015)

Since the approval of the original "Belmont Coal Project" in 2008 and the project modification in May 2010, Whitehaven Coal Limited has lodged a new Major Project application entitled the "Rocglen Coal Mine Extension Project" (PA 10_0015). This project includes, but is not limited to, the following components:

- *The expansion of the open cut pit to access up to an additional 5 million tonnes of coal;*
- *Increasing the size of the northern emplacement area to accommodate an additional 12 million bank cubic metres of overburden.*
- *revising the mines biodiversity offset strategy to incorporate the removal of 47.9ha of the 192.7 ha of the existing biodiversity offset; and*
- *relocating or realigning on-site infrastructure and facilities due to expanded pit or emplacement areas.*

The project has been determined as a "Controlled Action" under the EPBC Act in relation to threatened species and ecological communities listed under the EPBC Act, specifically impacts to an estimated 12 ha of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland and loss of habitat for the Swift Parrot and Regent Honeyeater. Following more detailed vegetation mapping as described in RPS (2010) and section 2.2 of this report, the area of White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland is 16.8 ha comprising 5.9 ha of intact woodland along Wean Road and 10.9 ha of DNG.

Whitehaven Coal Limited has received advice from the NSW Department of Environment, Climate Change and Water (DECCW 2010a) regarding the adequacy of an earlier proposed Biodiversity Offset Strategy and found that the offset strategy:-

- Was not underpinned by sound ecological principles;
- Did not adequately quantify the loss in biodiversity and the gain in biodiversity from the offset;
- Did not adequately demonstrate that the proposal will "maintain or improve biodiversity values";
- Did not fully demonstrate that the proposed offset had been appropriately targeted; and
- Did not address the cumulative impact of the proposed extension in relation to previous impacts.

Based on these concerns DECCW requested that the offset strategy be revised and address the information requirements outlined in Table 1.

Table 1: Compliance with DECCW requirements

REQUIREMENT	SECTION ADDRESSED
a) That the proponent be required to prepare, prior to public exhibition, an offset strategy which:	
• Demonstrates how the proposal will ensure a maintained or improved outcome;	Section 4.
• Considers all approved and proposed impacts (i.e. a cumulative offset should be presented);	Impacts to both the previously approved Biodiversity Offset areas and the current proposal (i.e. cumulative impacts) have been assessed. Refer to Section 3.1.1 and Section 3.1.2.
• Proposes offset ratios which are supported by a suitable metric;	The DECCW BioBanking methodology has been utilised in this Biodiversity Offset Strategy and has resulted in an overall offset ratio of 4.4:1. Refer to Section 3.
• Considers connectivity in its design;	All proposed offsets for the project have been allocated from the Whitehaven Regional Offset Site which is located within close proximity to the project site. The Whitehaven Regional Offset Site enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the rehabilitation of the Rocglen Coal Mine is complete.

REQUIREMENT	SECTION ADDRESSED
• Includes details of the relative condition and values of communities on the offset site in comparison to those to be impacted; and	The condition of Vegetation Types within the Whitehaven Regional Offset Site were assessed by biometric condition plots and are in biometric "moderate to good" condition which equates to the condition of the vegetation types at the project site. Refer to Section 2.1.
• Includes details of proposed management actions and expected gains.	The Whitehaven Regional Offset Site is in the process of being registered as a Biobank Site under Part 7A of the TSC Act and will be actively managed via a BioBanking management plan with in-perpetuity management funding.
b) That any approval granted be subject to conditions requiring the legal, in-perpetuity conservation commitments to be entered into prior to any approved works commencing.	The Whitehaven Regional Offset Site will have the highest level of conservation status outside of National Parks (via a Biobanking Agreement registered on title in perpetuity).

This report has been prepared to meet the requirements outlined in Table 1 and addresses the following matters:

- a brief summary of the cumulative impacts of previous approvals and the proposed extension (Section 3.3);
- how the 'like for like' and 'improve or maintain' offset requirements have been addressed (Section 4); and
- the proposed Biodiversity Offset Strategy (Section 5).

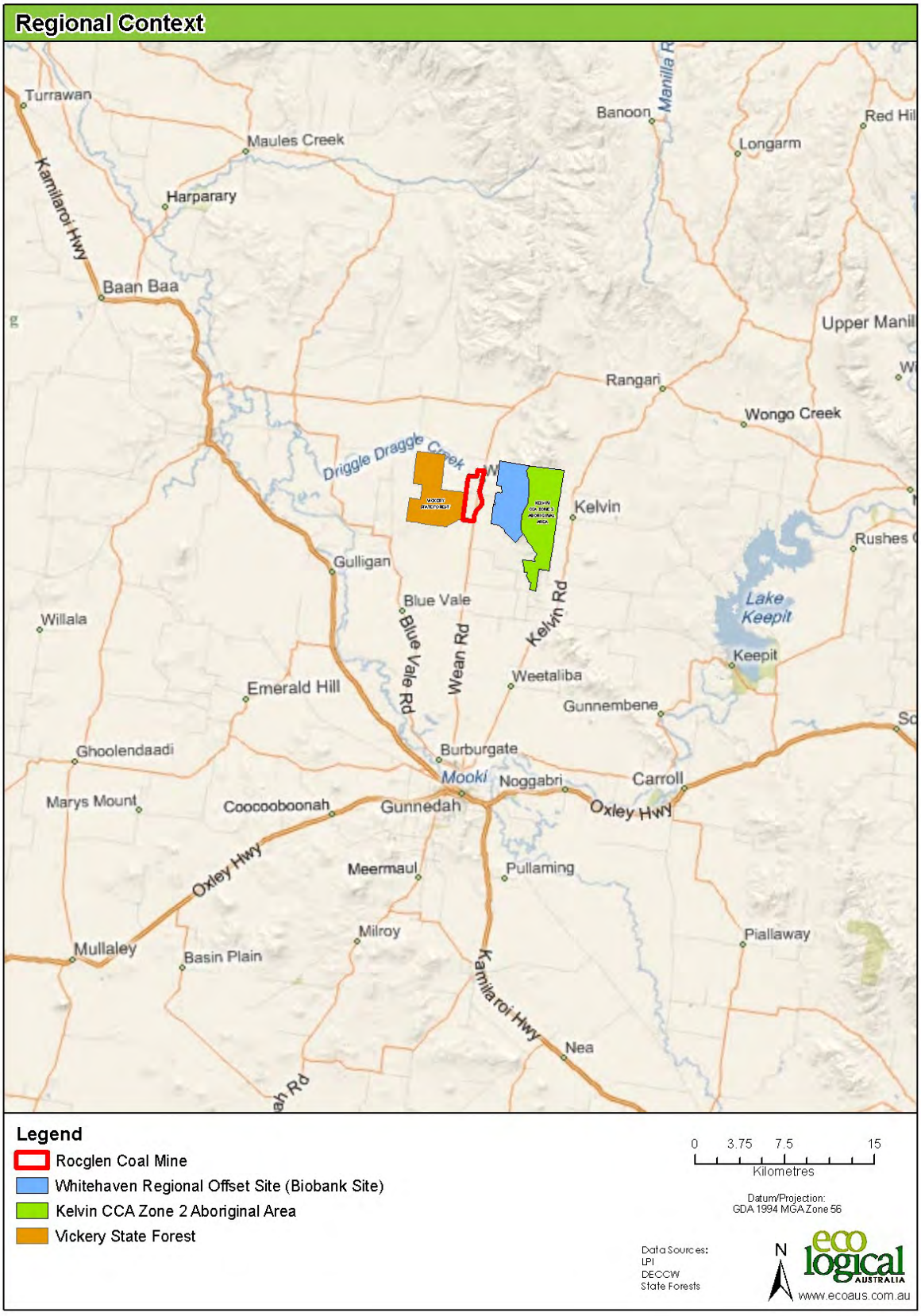

Figure 1: Regional Location of Rocglen Coal Mine

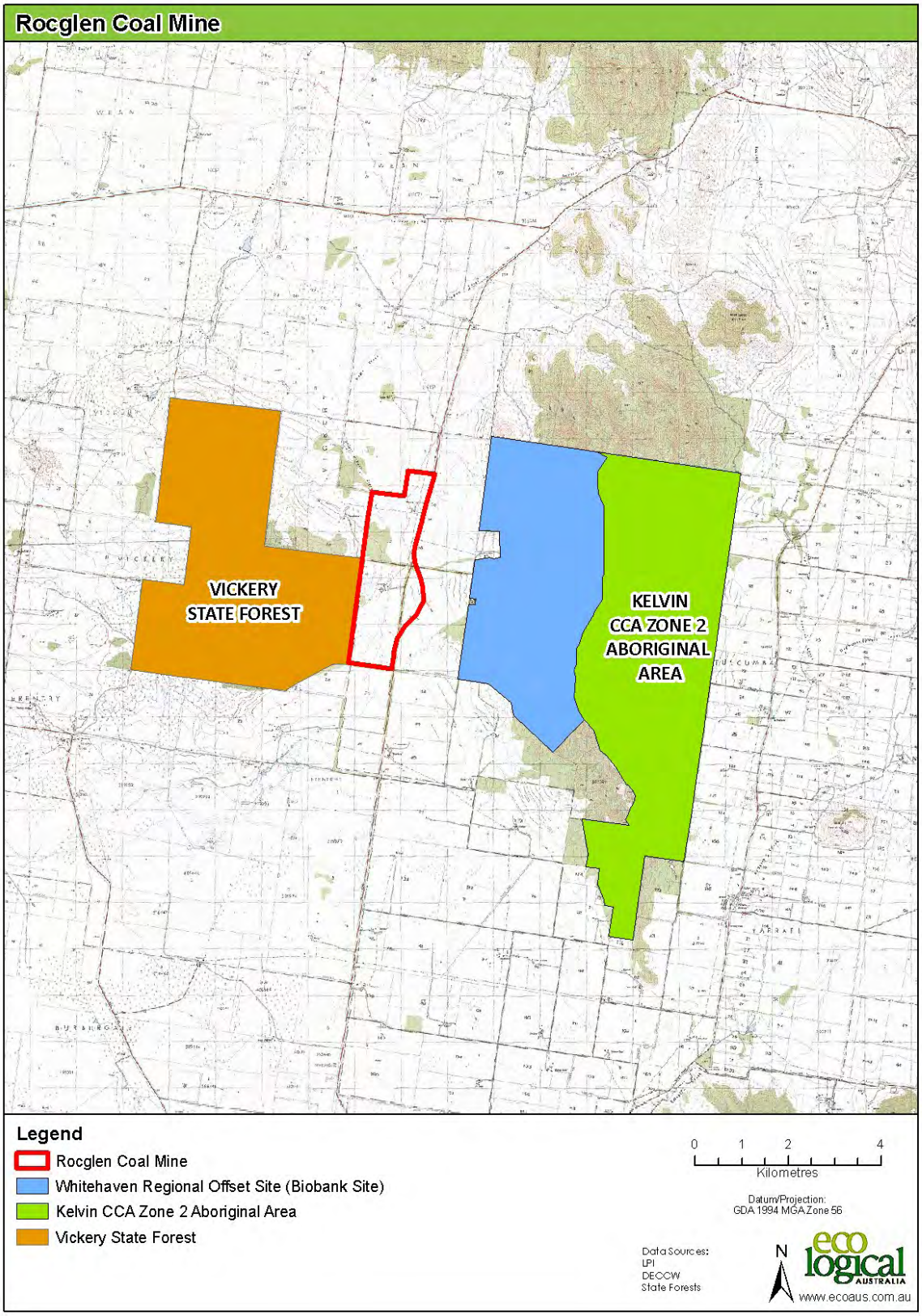

Figure 2: Rocglen Coal Mine Location

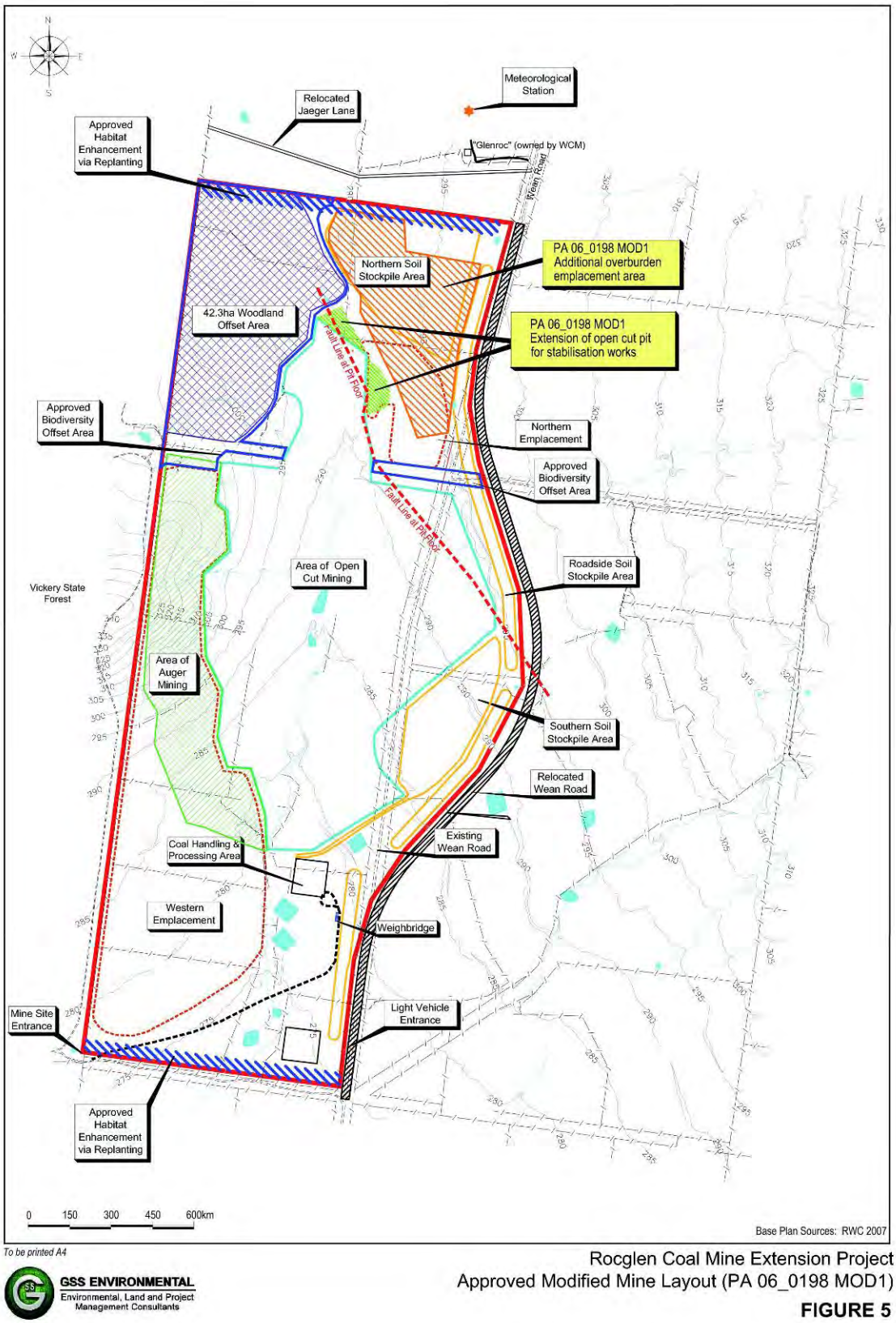

Figure 3: Approved Mine Layout (Figure 5 of the EA for the Rocglen Coal Mine Extension Project)

1.2 PREVIOUS STUDIES

1.2.1 GCNRC (2007) and CES (2007)

The flora and fauna assessments for the "Belmont Coal Project" (PA 06_0198) were prepared by Geoff Cunningham Natural Resource Consultants Pty Ltd (Cunningham 2007) and Countrywide Ecological Service (2007) respectively.

Eight vegetation communities were identified by Cunningham (2007) including three (Communities 4, 5 and 7) which were not mapped within the original boundaries of the project site. It should be noted that since the original project approval (PA 06_198) additional areas to the north of the project site have been included within the site boundary for the new major project application. The vegetation communities and the original impacts of the project are outlined in Table 2.

Table 2: Vegetation communities and impacts of the original project

VEGETATION COMMUNITY	LOCATION	PROJECT IMPACTS
1 - Narrow-leaf Ironbark – Pilliga Grey Box Community	Project Site	11.6 ha
2 - Pilliga Grey Box – White Cypress Pine Community	Project Site	23.4 ha
3 - Pilliga Grey Box – White Box – Yellow Box – White Cypress Pine Community	Project Site	1.3 ha
4 - Pilliga Grey Box – Belah – Bull Oak Community	Off Site	-
5 - Bimble Box Community	Off Site	-
6 - Brigalow Community	Project Site	-
7 - Regenerating White Cypress Pine	Off Site	-
8 - Cleared Lands – Used for Grazing and / or Cultivation	Project Site	unspecified
Total		**36.3 ha**

In addition to these vegetation communities, seven threatened fauna species were observed including *Falco hypoleucos* (Grey Falcon), *Melanodryas cucullata* (Hooded Robin), *Mormopterus beccarii (*Beccaris Mastiff-bat), *Neophema pulchella* (Turquoise Parrot), *Pachycephala inornata* (Gilbert's Whistler), *Pomatstomus temporalis* (Grey-crowned Babbler) and *Saccolaimus flaviventris* (Yellow-bellied Sheathtail-bat). No significant impact on these species was determined to be likely as a result of the proposed "Belmont Coal Project" (Countrywide Ecological Service 2007)

The assessment of impacts of the original proposal recommended that the Biodiversity Offset Strategy outlined in Table 3 and Figure 4 be implemented to compensate for the loss of 36.3 ha of native vegetation (as shown in Table 2). This strategy has been included in Condition 27 of the project approval (refer Section 1.1.1) and resulted in the protection of 44.9 ha of remnant woodland (42.3 ha remnant plus 2.6 ha at Jaeger Lane), enhancement planting and rehabilitation to 90.4 ha (rehabilitation of 84 ha and enhancement planting of 6.4 ha in a northern and southern corridor designed to from an east-west link between the Vickery State Forest and Kelvin Aboriginal Area and an additional 60 ha within the Regional Offset site, a total of 195.3 ha of protection and rehabilitation as shown in Figure 4.

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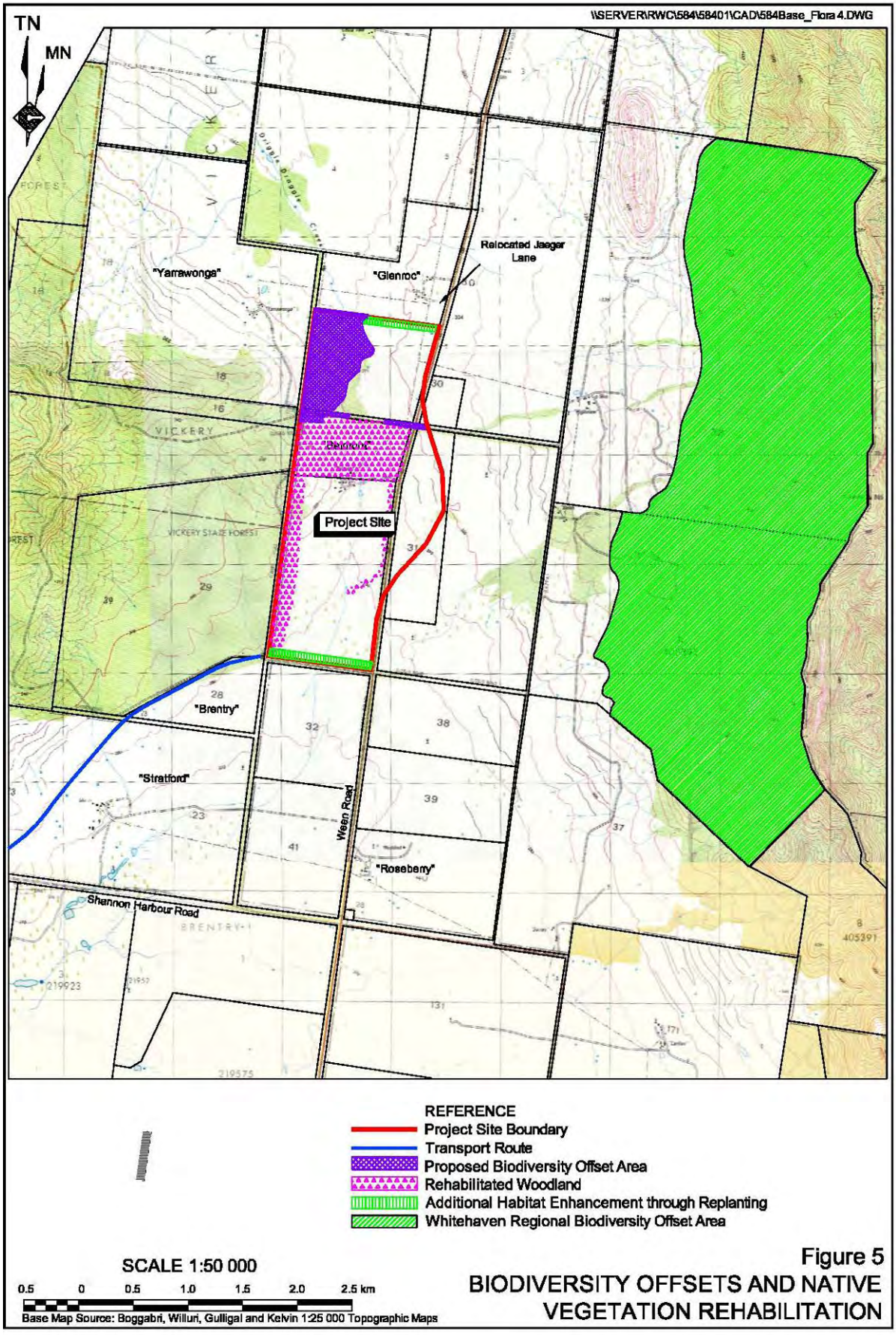


Figure 4: Biodiversity Offsets for PA 06_0198 (Figure 5 of Cunningham 2007)

Table 3: Original Biodiversity Offset Strategy for PA 06_0198

ITEM	DESCRIPTION	OFFSET AREA
1	Community 2 (Pilliga Grey Box – White Cypress Pine Community) in the north western corner of the project site on the "Glenroc" property	42.3 ha
2	Establishment of a 50m wide habitat corridor between the proposed offset area and Wean Road along the northern boundary of the Project Site. The vegetation enhancement activities would focus on extending the offset area proposed above. To achieve this end a small section of the offset area would be planted with native tree and shrub species representative of those occurring within Community 2. This replanted section would then be continued using the same species to provide a 50m wide linkage with Wean Road.	2.6 ha
3	Protection of 2.6 ha of Community 3 (Piliga Grey Box – White Box – Yellow Box – White Cypress Pine) at Jaeger Lane	2.6 ha
4	Establishment of a 50m wide habitat corridor within the Project Site on the northern side of Riordan Road This corridor is located along the southern boundary of the Project Site. This vegetation enhancement activity would involve establishing Community 1 type vegetation along the western section [i.e. west of the drainage line] and a community typical of the species found in Community 2 on the eastern section that links with Wean Road.	3.8 ha
5	Rehabilitation to native vegetation (within the disturbance footprint)	84 ha
6	Protection of 60 ha of vegetation in the Whitehaven Regional Biodiversity Offset area	60.0 ha
Total		**195.3 ha**

The Biodiversity Offset Strategy presented in Table 3 (Cunningham 2007) was accepted by the Department of Planning (DoP) and was subsequently included as Condition 27 of the Project Approval (PA 06_0198) with an additional 60 ha of vegetation to be allocated as an offset from the Whitehaven Regional Biodiversity Offset area (refer Section 1.1.1).

2 Field Assessment for Offset Strategy

2.1 VEGETATION MAPPING BY RPS (2010) AND ELA (THIS STUDY)

A flora and fauna assessment has been prepared for the proposed Rocglen Coal Mine Extension Project (PA 10_0015) by RPS Harper Somers O'Sullivan (RPS 2010) with additional vegetation mapping by Eco Logical Australia in October 2010 following a request from DECCW to "split" one of the Cunningham Vegetation Units (Cunningham Community 3). This Biodiversity Offset Strategy along with the RPS flora and fauna assessment forms part of the EA documentation for the project.

RPS (2010) and Eco Logical Australia identified five biometric vegetation communities within the project site plus cleared land. These vegetation communities and their correlation to the previous Cunningham vegetation mapping and the impacts of the Rocglen Coal Mine Extension Project, as described in GSS (2010a) and RPS (2010) are summarised in Table 4.

2.2 BIOMETRIC VEGETATION TYPE CONVERSION AND MAPPING

The vegetation mapping within the project site was updated using a 'heads-up' on-screen digitising approach to capture small patches of vegetation which had not previously been mapped and to refine vegetation community boundaries where appropriate. Areas which had been previously approved (PA 06_0198 and Modification 1) were mapped as "Approved Development" in the vegetation layer (Figure 5) irrespective of whether they had been developed or not at the time of the condition assessment.

Areas previously identified as *Vegetation Community 8 - Cleared Land use for grazing and/or cultivation in* Cunningham (2007) were categorised into two BioMetric vegetation types based on the plot data, surrounding vegetation types, topography and soils. Some areas of *Vegetation Community 8* within the original project site boundary did not meet the definition of 'low condition' as defined by the BioBanking methodology and were mapped as "cleared" (Figure 5). Small areas such as roads, buildings and dams were also mapped as "cleared" where clearly visible from aerial photography.

The vegetation communities identified at the project site during the vegetation condition assessment were converted to BioMetric vegetation types through comparison between the BioMetric plot data and the BioMetric Vegetation Types Database (DECCW 2010b). The equivalent BioMetric vegetation types for each vegetation community are outlined in Table 4.

2.3 VEGETATION CONDITION ASSESSMENT

Eco Logical Australia (ELA) conducted a quantitative assessment of vegetation condition at the project site and adjoining potential offset areas (the "Yarrawonga" and "Greenwood" properties) utilising the Biobanking Assessment Methodology (DECC 2009) ('the Biobanking Methodology'), from 20 to 22 October 2010.

This Biobank Assessment does not and was not intended to form a formal Biobank Assessment as it does not comply fully with the Biobanking Methodology. It has been used, as recommended by DECCW to "inform" the "improve or maintain" assessment in Section 4 of this report and provide a "quantum" of area required to offset the impacts of the project.

A total of 23 full floristic BioBanking plots were undertaken, including:

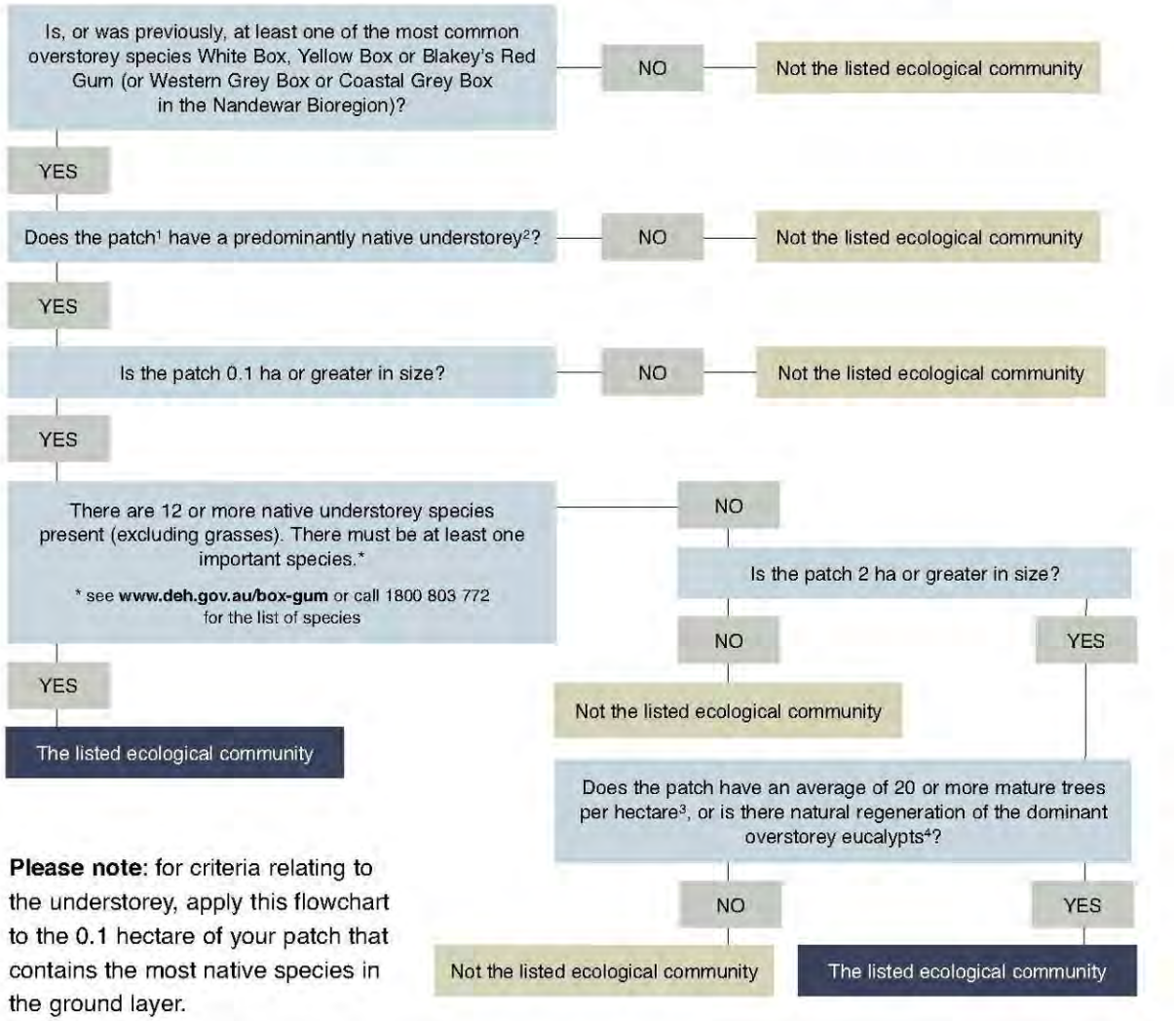
- Rocglen Coal Mine – 8 plots;
- Yarrawonga – 7 plots; and
- Greenwood – 8 plots.

The BioBanking plots were stratified across each vegetation type in each broad condition state (i.e. remnant woodland, disturbed woodland, derived native grasslands and exotic pasture). Where possible, plots were located in areas likely to be impacted on by the proposed Rocglen Coal Mine Extension Project. Three plots were located in areas previously identified as Biodiversity Offsets for the original proposal (PA 06_0198) in order to quantify the condition of these areas. Only those plots utilised in this Biodiversity Offset Strategy are presented in Figure 5.

2.4 EPBC ACT LISTED COMMUNITIES

A quantitative assessment of the presence/absence of the EPBC Act listed Critically Endangered Ecological Community White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland was undertaken during the field assessment. The assessment followed the methodology outlined in the *EPBC Act policy statement 3.5 - White box - yellow box - Blakely's red gum grassy woodlands and derived native grasslands* and as outlined in the following flow-chart.

Determining if your land has an area of the listed ecological community



Please note: for criteria relating to the understorey, apply this flowchart to the 0.1 hectare of your patch that contains the most native species in the ground layer.

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1 Patch – a patch is a continuous area containing the ecological community (areas of other ecological communities such as woodlands dominated by other species are not included in a patch). In determining patch size it is important to know what is and is not, included within any individual patch. The patch is the larger of:

- an area that contains five or more trees in which no tree is greater than 75 m from another tree, or
- the area over which the understorey is predominantly native.

Patches must be assessed at a scale of 0.1 ha (1000m^2) or greater.

2 A predominantly native ground layer is one where at least 50 per cent of the perennial vegetation cover in the ground layer is made up of native species. The best time of the year to determine this is late autumn when the annual species have died back and have not yet started to regrow. (At other times of the year, you can determine whether something is perennial or not is if it is difficult to pull out of the soil. Annual species pull out very easily.)

3 Mature trees are trees with a circumference of at least 125 cm at 130 cm above the ground.

4 Natural regeneration of the dominant overstorey eucalypts when there are mature trees plus regenerating trees of at least 15 cm circumference at 130 cm above the ground.

Table 4: Vegetation communities identified by ELA and RPS (2010) and relationship to Cunningham (2007)

COMMUNITY (CUNNINGHAM 2007)	BIOMETRIC VEGETATION TYPE	Rocglen Coal Mine Extension project Impacts
1 - Narrow-leaf Ironbark – Pilliga Grey Box Community	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	9.7 ha
2 - Pilliga Grey Box – White Cypress Pine Community	Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	27.9 ha
3 - Pilliga Grey Box – White Box – Yellow Box – White Cypress Pine Community	Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	3.4 ha
	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	5.9 ha
6 - Brigalow Community	Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)	0.14 ha
8 - Cleared Lands – Used for Grazing and / or Cultivation	Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	37.5 ha DNG
	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	10.9 ha DNG
	Cleared	
Total		**95.44 ha**

In addition to the threatened fauna observed by Countrywide Ecological Service (2007), RPS observed *Pyrrholaemus sagittatus* (Speckled Warbler) on the project site and *Stagonopleura guttata* (Diamond Firetail) and *Daphoenositta chrysoptera* (Varied Sittella) on a neighbouring property. Potential habitat was identified at the project site for an additional thirteen species on the *Threatened Species Conservation Act 1995* (TSC Act), two threatened and seven of the migratory species listed on the EPBC Act

No significant impact on these fauna species was determined to be likely as a result of the proposed Rocglen Coal Mine Extension Project (RPS 2010).

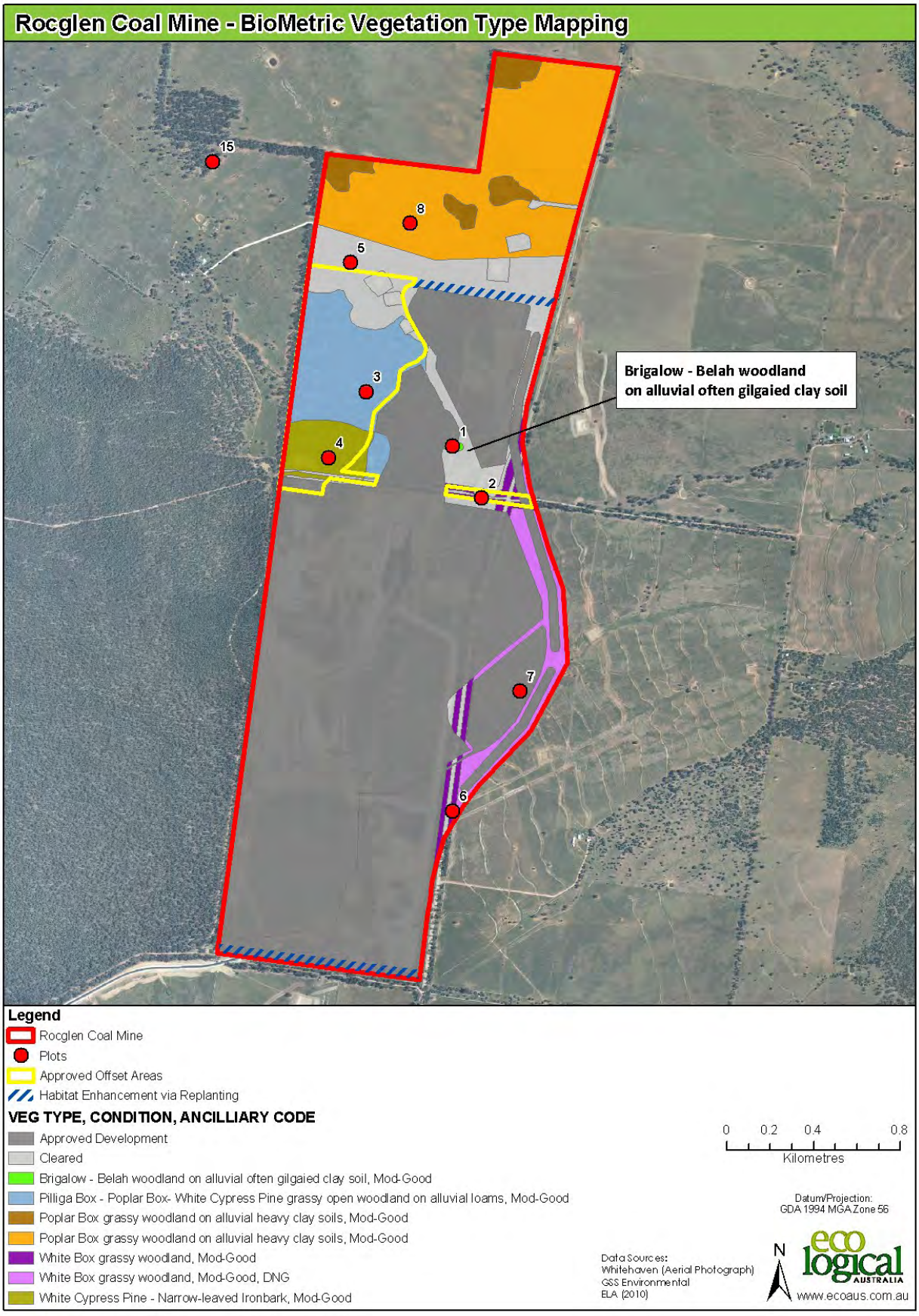

Figure 5: Vegetation Type Mapping

3 Impacts of the Rocglen Coal Mine

3.1 ASSUMPTIONS

In accordance with discussions with Peter Christie of the DECCW, two separate BioBanking credit calculations were undertaken for this Biodiversity Offset Strategy. The first was undertaken to determine the credit value of the existing approved (PA 06_0198) Biodiversity Offset areas which are now going to be impacted (i.e. a 'BioBank' site scenario) and the second was undertaken to determine the value of all remaining vegetation on the project site that is going to be impacted as part of the mine extension project outside of previously approved development areas (i.e. a 'Development' site scenario).

This methodology was required to be implemented to account for the impacts to the existing approved Biodiversity Offset areas (Figure 4) and for the removal of all remaining vegetation within the boundaries of the project site as part of the Rocglen Coal Mine Extension Project (Figure 6), i.e. this offset strategy has addressed the requirements of the original impacts for which the offset areas in Table 3 were provided for as well as the impact to these areas as part of the mine extension project.

For the purposes of this Biodiversity Offset Strategy, it has been assumed that the layout presented in Figure 5 of the EA for the Rocglen Coal Mine Extension Project (as depicted in Figure 3: of this report) includes all previously approved infrastructure (including the open cut mine, overburden emplacement areas, soil stockpiles, site office and facilities, roads and dams). All areas which fall outside of the previously approved footprint have been included in this assessment.

A number of specific assumptions were made in relation to each assessment:

3.1.1 Existing approved Biodiversity Offset areas (BioBank site scenario) assumptions:

- As the approved Biodiversity Offset areas (PA 06_0198) were to be established post approval (i.e. once the mine became operational), the BioBank site scenario assumed that all vegetation approved for development had been cleared when assessing the landscape value of the BioBank site.
- Native vegetation (canopy only) remaining within the 1000ha circle was visually estimated at 30%. It is noted that a large proportion of the vegetation within the 1000ha assessment circle consists of derived native grassland, however only canopy has been included in this assessment as per the BioBanking methodology. Due to the proximity to the next canopy cover threshold (31-40%), the precautionary principle was applied and vegetation remaining within the 1000ha circle was increased to the next category (31-40%).
- Some of the areas mapped as "cleared" during the condition assessment (Figure 5) were specified to have additional management actions as part of the approved/existing Biodiversity Offsets (e.g. habitat enhancement via replanting of trees and shrubs as described in Table 3). In accordance with the BioBanking Methodology, these areas were allocated a condition of 'low' which allows these areas to be entered as vegetation zones into the BioBanking calculator (to determine potential future value) and assess the number of credits that would have been generated as part of an enhanced management program.
- For all areas mapped as "cleared" within the Biodiversity Offset (including those areas identified for "habitat enhancement via replanting"), it has been assumed that only the midstorey and canopy layers would be restored as described in the original offset requirements in Table 3. In

accordance with the BioBanking methodology, additional increases to the site value for species richness, over-storey cover and mid-storey cover were applied to account for additional management actions which would have been implemented in these areas. This results in additional credits being generated which now need to be offset a second time.

3.1.2 Rocglen Coal Mine Extension Project ('Development' site scenario) assumptions:

- Areas identified as "cleared" during the condition assessment were not included in the 'Development' site scenario in accordance with the BioBanking Methodology. This is a function of areas proposed for rehabilitation in the BioBank assessment (i.e. habitat enhancement via replanting) not having been rehabilitated at this time of this assessment.
- The Brigalow - Belah woodland patch was artificially increased from 0.1 ha to 0.25 ha to allow a vegetation zone to be entered into the BioBanking calculator. No adjoining vegetation was present in the vicinity of this vegetation type. The resulting credits required for this vegetation zone have been prorated to 0.1 ha.
- A BioMetric plot was not completed in Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) within the boundaries of the project site. A plot from the adjoining "Yarrawonga" site was utilised for the assessment. The adjoining plot is considered to be of equal or greater value than the vegetation on the project site and is thus a conservative approach to the amount of loss at the impact site.

3.2 DIRECT AND INDIRECT IMPACTS TO ENDANGERED ECOLOGICAL COMMUNITIES AND NATIVE VEGETATION

The direct and indirect impacts to threatened species, populations and ecological communities and their habitats resulting from the proposed Rocglen Coal Mine Extension Project are documented in the Flora and Fauna Assessment Report prepared by RPS (2010). The project proposes to 'clear' all remaining vegetation within the project site (including 47.9 ha of the previously determined Biodiversity Offset areas) except for a small area of Poplar Box Grassy Woodland in the north western corner and a roughly square 30 ha area which forms the north eastern section of the project site (Figure 6). While not all vegetation within the impact footprint is likely to be cleared, Whitehaven Coal has requested the offset assessment to be undertaken on the assumption that all vegetation shown on Figure 6 will be cleared to allow more flexibility to site, if required, associated infrastructure such as roads and stockpiles in peripheral areas. Thus offset strategy thereby provides for the complete loss of all vegetation remaining within the project site regardless of whether these impacts occur.

RPS (2010) provides a full description and documentation of these proposed impacts.

The revised direct and impacts of the proposed Rocglen Coal Mine Extension Project are outlined in Table 5 and total 95.44 ha of vegetation.

In relation to the EPBC Act listed White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland CEEC, the proposal will directly impact on 5.9 ha of intact remnants made up of 7 patches, each less than 1 ha in area along Wean Road and Jaeger lane and 10.9 ha of DNG in long narrow bands between approved stock piles on the eastern boundary of the project site.

Table 5: Impacts of the proposed Rocglen Coal Mine Extension Project

Impacts to EPBC Act listed communities shown in yellow

VEGETATION TYPE	BIOMETRIC CONDITION	ANCILLIARY CODE	AREA (HA)
Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)	Moderate to Good		0.14 ha
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	Moderate to Good		27.9 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	Moderate to Good		3.4 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	Moderate to Good	Derived Native Grassland (DNG)	37.5 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Moderate to Good		5.9 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Moderate to Good	Derived Native Grassland (DNG)	10.9 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	Moderate to Good		9.7 ha
Total			**95.44 ha**

All of the vegetation to be impacted as part of the mine extension project provides foraging habitat for the EPBC Act listed Regent Honeyeater and Swift Parrot other than the DNG areas, even though they have not been recorded on site i.e. this offset strategy addresses the loss up to 47.04 ha of foraging habitat from the proposed extension and the equivalent of 15 ha for impacts associated with the loss of part of the original offset areas, a total of 62.04 ha of foraging habitat.

As the proposed Rocglen Coal Mine Extension Project requires the removal of the existing Biodiversity Offset areas, the area of each vegetation type within the previously approved Biodiversity Offset Area have been calculated in addition to those outlined above (Table 6 and Figure 6).

3.3 CUMULATIVE LOSS OF PROPOSED EXTENSION AND ORIGINAL IMPACTS

The cumulative losses of all impacts at the Rocglen Mine are thus the combination of Table 2 (Approved clearing re PA -06-198) and Table 5 (proposed extension) and total 131.74 ha as shown in Table 7.

Table 6: Impacts to existing Biodiversity Offset Area as shown in Figure 6.

VEGETATION TYPE	CONDITION	ANCILLIARY CODE	AREA (HA)
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	Moderate to Good	Remnant Woodland	25.2 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Moderate to Good	Remnant Woodland	0.9 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	Moderate to Good	Remnant Woodland	8.8 ha
Cleared (assumed to be rehabilitated as part of the Biodiversity Offset)	Cleared	N/A	8.9 ha
Approved Development (assumed to be rehabilitated during mine closure)	Cleared	N/A	1.5 ha
Approved habitat enhancement via replanting (northern area) Assumed to be rehabilitated with trees and shrubs as specified by Cunningham (2007) and Table 3	Cleared	N/A	2.6 ha
Total			**47.9 ha**

Table 7: Cumulative loss of vegetation from existing approvals and proposed extension

VEGETATION TYPE	Condition	PA 06-198 (Approved)	AREA (HA)
Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)		0 ha	0.14 ha
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone		23.4 ha	27.9 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)		1.3 ha	3.4 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	Derived Native Grassland (DNG)		37.5 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions			5.6 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Derived Native Grassland (DNG)		11.3 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion		11.6	9.7 ha
Total		**36. 3 ha**	**95.44 ha**

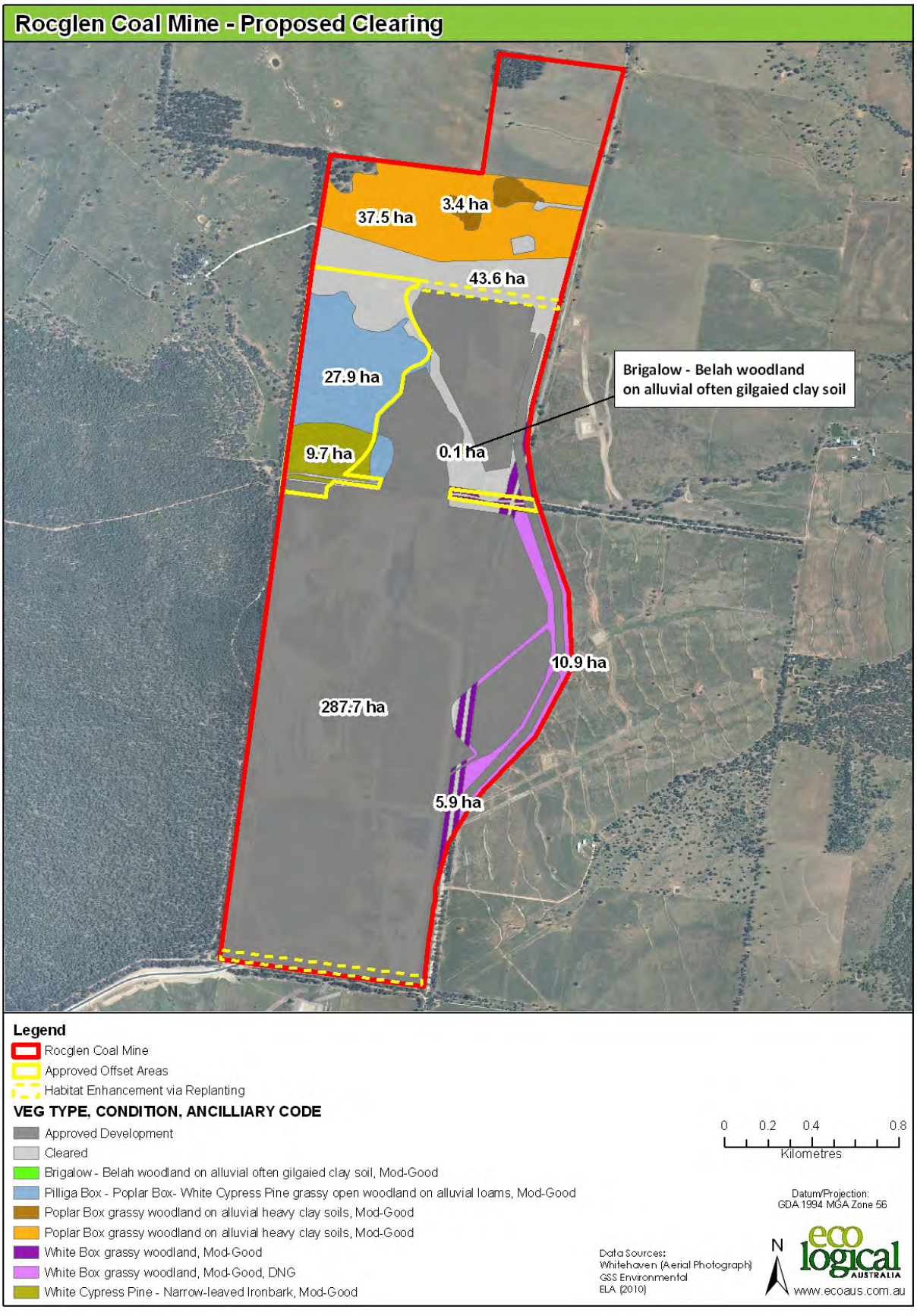

Figure 6: Clearing proposed as part of the proposed Rocglen Coal Mine Extension Project

4 Offset requirements to meet 'like for like' and 'maintain or improve' outcomes.

Consultation has been undertaken with Peter Christie at the DECCW to clarify the methodology required to be undertaken for the assessment and to determine the 'like for like' requirements in relationship to the impacted vegetation types.

DECCW advised that the methodology undertaken in Section 3 would be considered appropriate to determine the cumulative impacts of the proposed Rocglen Coal Mine Extension Project. DECCW also advised that the offset strategy is required to justify the use of "equivalent" vegetation types in accordance with the DECCW's published offset principles included at Appendix 2 (DECC 2008) and that the condition assessment of the proposed Rocglen Coal Mine Extension Project and proposed offset area is to be sufficient to identify the vegetation types, their relative condition and the threatened fauna likely to use the areas.

4.1 OFFSET PRINCIPLES

As requested by DECCW, any proposed offsets for the proposal must be *based on sound ecological principles*, meet the '*like for like or better*' requirement and provide information on the '*maintain and improve*' conservation outcomes.

In this regard, both the DECCW (DECC 2008) and the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPC formerly DEWHA and DEWR)(DEWR 2007) have published a list of principles that must be considered when considering offset strategies. These principles are included in Appendices 2 and 3 of this report and relevant sections discussed below.

4.2 LIKE FOR LIKE OR BETTER

DECCW offset principle number 10 states that offset strategies:-

> *"must offset impacts on the basis of like-for-like or better conservation outcome. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance condition by management actions and the removal of threats. Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets".*

The proposed offsets for the project have been allocated from the Whitehaven Regional Offset Biobank Site which contains a number of vegetation types considered to have equal or greater conservation status in relation to their legal status under the TSC and/or EPBC Acts, and/or their percentage cleared in the Namoi CMA and/or the range of faunal habitat values that they provide for each of the vegetation types being impacted as shown in Table 8 (i.e. they meet the like for like or better criteria).

Table 8: Equivalent conservation status of vegetation types at the Whitehaven Regional Offset Site

Threatened communities triggering EPBC Act controlled action are highlighted in yellow.

IMPACT VEGETATION TYPES				PROPOSED OFFSET VEGETATION TYPES IN WHITEHAVEN REGIONAL BIOBANK SITE			
BioMetric	**Status**	**Vegetation Formation**	**% Cleared (Namoi CMA)**	**BioMetric**	**Status**	**Vegetation Formation**	**% Cleared (Namoi CMA)**
Brigalow - Belah woodland	EEC (TSC Act and EPBC Act)	Semi-arid Woodlands (Grassy subformation)	90	White Box grassy woodland	EEC (TSC Act and CEEC EPBC Act)	Grassy Woodlands	85
Pilliga Box - Poplar Box- White Cypress Pine	Not Listed	Dry Sclerophyll Forests (Shrub/grass subformation)	80	White Box - White Cypress Pine	Not listed	Dry Sclerophyll Forests (Shrub/grass subformation)	55
				Semi-evergreen vine thicket	Not listed	Rainforests	85
Poplar Box grassy woodland	Not listed	Semi-arid Woodlands (Grassy subformation)	75	White Box grassy woodland	EEC (TSC Act and CEEC EPBC Act)	Grassy Woodlands	85
				Semi-evergreen vine thicket	Not listed	Rainforests	85
White Box grassy woodland	CEEC (TSC Act and EPBC Act)	Grassy Woodlands	85	White Box grassy woodland	EEC (TSC Act and CEEC EPBC Act)	Grassy Woodlands	85
White Cypress Pine - Narrow-leaved Ironbark	Not Listed	Dry Sclerophyll Forests (Shrubby subformation)	55	White Cypress Pine - Narrow-leaved Ironbark	Not Listed	Dry Sclerophyll Forests (Shrubby subformation)	55

It is noted that each vegetation type impacted by the project is to be offset with the same vegetation type (on the adjoining Whitehaven Regional Biobank Site approximately 1km to the east of the mine site) or other vegetation types that have the same or higher conservation status (TSC Act and/or EPBC Act), or the same or a higher percentage cleared in the Namoi CMA or are in the same vegetation formation.

The EPBC Act listed White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland is proposed to be offset with the same vegetation community. Impacts to the EPBC Act listed Brigalow, whilst not triggering a controlled action due to the extremely small area (0.14 ha) is proposed to be offset with White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland (a threatened community with a higher conservation status).

Table 9 summaries threatened fauna species recorded at the project site (Countrywide Ecological Service 2007, RPS 2010) and whether they have been predicted (DECCW Biobanking tool), recorded (site assessment) or are likely to occur (Wildlife Atlas records within 10 km radius) at the Whitehaven Regional Biobank Site. Considering the proximity of the project site to the Whitehaven Regional Biobank Site and the similarity in vegetation types present, it is likely that all threatened species recorded at the project site or predicted to occur, including the EPBC Act listed Regent Honeyeater and Swift Parrot, would utilise the same resources at the Whitehaven Regional Biobank Site, i.e. the proposed offset areas also provide 'like for like' threatened fauna habitat values as the impact area.

Table 9: Recorded and predicted threatened fauna at the project site and Whitehaven Regional Offset Site

A 'No' in the following table indicates that the species was not recorded during site assessment. A blank cell indicates that the species has not been predicted and as targeted surveys have not been undertaken may or may not occur.

Species triggering EPBC Act controlled action highlighted in yellow

		IMPACT SITE		PROPOSED OFFSET SITE	
COMMON NAME	**SPECIES**	**PREDICTED ON PROJET SITE**	**RECORDED IN PREVIOUS STUDIES**	**PREDICTED AT WHITEHAVEN REGIONAL BIOBANK SITE**	**RECORDED ON OR NEAR OFFSET SITE (NPWS ATLAS WITHIN 10KM)**
Australian Bustard	*Ardeotis australis*	Yes	No	Yes	
Barking Owl	*Ninox connivens*	Yes	No	Yes	Yes
Beccaris Mastiff-bat	*Mormopterus beccarii*	No	Yes	No	
Black-chinned Honeyeater (eastern subspecies)	*Melithreptus gularis gularis*	Yes	No	Yes	
Black-striped Wallaby	*Macropus dorsalis*	Yes	No	Yes	
Brown Treecreeper (eastern subspecies)	*Climacteris picumnus victoriae*	Yes	No	Yes	Yes
Bush Stone-curlew	*Burhinus grallarius*	Yes	No	Yes	

		IMPACT SITE		PROPOSED OFFSET SITE	
COMMON NAME	SPECIES	PREDICTED ON PROJET SITE	RECORDED IN PREVIOUS STUDIES	PREDICTED AT WHITEHAVEN REGIONAL BIOBANK SITE	RECORDED ON OR NEAR OFFSET SITE (NPWS ATLAS WITHIN 10KM)
Diamond Firetail	*Stagonopleura guttata*	Yes	No	Yes	Yes
Eastern Cave Bat	*Vespadelus troughtoni*	Yes	No	Yes	
Eastern Pygmy-possum	*Cercartetus nanus*	Yes	No	Yes	
Gilbert's Whistler	*Pachycephala inornata*	No	Yes	No	
Glossy Black-cockatoo	*Calyptorhynchus lathami*	Yes	No	Yes	
Greater Long-eared Bat (south eastern form)	*Nyctophilus timoriensis*	Yes	No	Yes	
Grey Falcon	*Falco hypoleucos*	No	Yes	No	
Grey-crowned Babbler (eastern subspecies)	*Pomatostomus temporalis temporalis*	Yes	Yes	Yes	Yes
Hooded Robin (south-eastern form)	*Melanodryas cucullata cucullata*	Yes	Yes	Yes	Yes
Koala	*Phascolarctos cinereus*	Yes	No	Yes	Yes
Little Pied Bat	*Chalinolobus picatus*	Yes	No	Yes	Yes
Malleefowl	*Leipoa ocellata*	Yes	No	Yes	
Masked Owl	*Tyto novaehollandiae*	Yes	No	Yes	Yes
Painted Honeyeater	*Grantiella picta*	Yes	No	Yes	Yes
Pilliga Mouse	*Pseudomys pilligaensis*	Yes	No	No	

		IMPACT SITE		PROPOSED OFFSET SITE	
COMMON NAME	SPECIES	PREDICTED ON PROJET SITE	RECORDED IN PREVIOUS STUDIES	PREDICTED AT WHITEHAVEN REGIONAL BIOBANK SITE	RECORDED ON OR NEAR OFFSET SITE (NPWS ATLAS WITHIN 10KM)
Regent Honeyeater	*Xanthomyza phrygia*	Yes	No	Yes	Yes
Speckled Warbler	*Pyrrholaemus sagittatus*	Yes	Yes	Yes	Yes
Spotted-tailed Quoll	*Dasyurus maculatus*	Yes	No	Yes	
Squirrel Glider	*Petaurus norfolcensis*	Yes	No	Yes	
Superb Parrot	*Polytelis swainsonii*	Yes	No	Yes	
Swift Parrot	*Lathamus discolor*	Yes	No	Yes	
Turquoise Parrot	*Neophema pulchella*	No	Yes	Yes	Yes
Turquoise Parrot	*Neophema pulchella*	Yes	No	Yes	
Yellow-bellied Sheathtail-bat	*Saccolaimus flaviventris*	Yes	Yes	Yes	Yes

4.3 IMPROVE OR MAINTAIN CONSERVATION OUTCOMES

DECCW offset principle number 6 states that:-

> *"Offsets should aim to result in a net improvement in biodiversity over time. Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site. Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset against the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation*.
>
> *Offsets may include enhancing habitat, reconstructing habitat in strategic areas to link areas of conservation value, or increasing buffer zones around areas of conservation value and removal of threats by conservation agreements or reservation".*

Other than the Biobanking Methodology, there is no standard framework or legislative requirement to provide an offset of a certain size. The adequacy of proposed offset have traditionally been based on the biodiversity values to be impacted (type, area and condition), conservation status (endangered or

not threatened community), the social and economic benefits of the proposal and the ability to secure and manage the proposed offsets.

DECCW however prefers that an assessment of the offset requirements is calculated using the Biobanking Methodology to determine the 'quantum' of offset required, and these results are then used to "inform" the negotiation of suitable offset packages taking into consideration the social and economic benefits of the project, even if the area required under the Biobanking Methodology is not attained.

Accordingly, a quantitative assessment of vegetation condition at the project site utilising the BioBanking Methodology was undertaken by ELA as part of this Biodiversity Offset Strategy. Whilst the field survey techniques undertaken for this Biodiversity Offset Strategy did not comply fully with the methodology required for a full Biobanking Assessment (only in respect to the number of site condition plots undertaken), as the project is being assessed under Part 3A of the *Environmental Planning and Assessment Act* 1979 and not as a Biobanking Assessment, sufficient data was obtained from the proposed impact areas to enable robust estimates of the area of offset required under this methodology to meet the requirement to '*provide information on the maintain or improve conservation outcome*'. This is consistent with advice from the DECCW who advised that a number of indicative condition plots in each vegetation zone would be adequate (Peter Christie pers. comm., DECCW). The results of these calculations were then used to inform the proposed offset package. A summary of the plot data and photographs of each vegetation community showing the range of conditions is included at Appendix 1.

The credit reports generated by these indicative assessments have been included in Appendix 4 (Biobank Agreement in relation to impacts to existing offset areas) and Appendix 5 (Biobank Statement in relation to impacts as a result of the proposed mine extension). A summary of the credits required to offset the impact of the project and meet a *'maintain and improve'* outcome and the number of credits available to be retired from the Whitehaven Regional Biobank Site are provided in Table 10 and Table 11.

Table 10: Total credits required to offset the impact of the proposal including the original Biodiversity Offset areas (Liverpool Plains B Subregion)

	EXISTING OFFSET AREAS TO BE REPLACED		IMPACTS LIFE OF MINE PROJECT	
VEGETATION TYPE IMPACTED	**AREA (HA)**	**CREDITS GENERATED#**	**AREA IMAPCTED (HA)**	**CREDITS REQUIRED**
Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)	0 ha	0	0.14	6*
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	25.2 ha	303	27.9	1,418
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	0 ha		40.9	1,693
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	0.9 ha	8	16.8	776
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar	8.8 ha	65	9.7	488

Bioregion				
Cleared land to be rehabilitated to Piliga Box	8.9 ha	72		
Cleared land to be rehabilitated to Poplar Box	2.6	19		
Cleared land to be rehabilitated White Cypress Pine	1.5	11**		
Total	**47.9 ha**	**478**	**95.4**	**4,381**

#This column shows the number of credits that would have been generated had the areas set aside in the original offsets been managed under Biobank conditions. The number of credits generated needs to be replaced by the same number of credits generated at an alternative site.

**Credits required for Brigalow - Belah woodland have been prorated from 0.25 ha to 0.14 ha as described in Section 3.1.2*

*** Credits generated in the currently cleared area have been prorated from 5.3 ha in the credit report (Appendix 4) to 1.5 ha as the credit calculator tool "lumped" the cleared vegetation polygons together.*

Table 11: Number of credits available at the Whitehaven Regional Biobank Site

VEGETATION TYPE	AREA (HA)	CREDITS GENRATED	CREDITS GENERATED /HA	CREDITS REMAINING	AREA REMAINING (HA)
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	176.2	1,977	11.2	1,820	162.5
White Box - White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	486.8	3,627	7.5	2,822	376.3
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	350.6	3,216	10.4	1,402	134.8
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	474.1	4,934	9.2	2,415	262.5
Total	**1487.7**	**13,754**	**9.25**	**8,459**	**936.1 ha**

Table 10 and Table 11 illustrate that in order to meet a *'maintain and improve'* outcome, the offset for the proposed mine extension and replacement to the original offset areas would need to be in the order of 525 hectares based on the average number of credits generated per hectare at the Regional Biobank Site (i.e. 4,859 credits required at 9.25 credits/ha).

5 Proposed Biodiversity Offset Strategy

The Biodiversity Offset Strategy proposed for the Rocglen Coal Mine Extension Project (PA 10_0015) and replacement of original offset areas is to retire the full 4,859 credit requirement as calculated in Section 4 and Appendices 4 and 5 and shown in Table 10 from the Whitehaven Regional Biobank Site.

The Whitehaven Regional Biobank Site is in the final stages of being registered as a Biobank Site and will have a Biobank Agreement registered on title and will be required to be managed in accordance with a Biobank Site Management Plan approved by DECCW. Funds for in-perpetuity conservation management will be held in Trust and paid to the Biobank Site operator (currently Whitehaven Coal) on an annual basis subject to the submission of an annual report that documents the management activities undertaken. If DECCW is not satisfied with the management, management funds can be withheld until such time the management action has been completed to the satisfaction of DECCW or funds provided to a third party appointed by DECCW to undertake the necessary management action.

An offset property with a Biobank Agreement is the highest level of conservation agreement outside of reservation under the National Parks Act 1975 due to the Agreement being registered on title and management funds, calculated for in perpetuity management held in Trust.

The number and types of credits to be retired is shown in Table 12 and corresponds to the “like for like or better” evaluation in Table 8. This is equivalent to an area of around 525 ha or an offset ratio of 4.75:1 for the 95.44 ha of impact for the mine extension and replacement for the 47.9 ha of 111.3 ha of the original offset area impacted by the mine extension (this equates to approximately 15 ha of the original 36.3 ha of impacts resulting from PA -06-198 as shown in Table 2). i.e. a total impact of 110.44 ha for the mine extension and 131.74 ha of cumulative impact for all approvals.

The proposed Biodiversity Offset Strategy meets the specific principles of offsets in NSW, particularly principles 6 and 10. Key components of the offset package include:

- The vegetation at the Whitehaven Regional Biobank Site is of equal or greater conservation status to the project site;
- The offset area is almost 5 times the size of the cumulative area to be impacted at the project site (proposed mine extension impacts of 95.44 ha and replacement offset for impacts to 47.9 ha of the 111.3 ha of the original offsets provided for the original mine approval);
- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks (via a registered Biobanking Agreement that is currently being assessed by DECCW);
- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking management plan with in-perpetuity management costs held in Trust; and
- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy

Woodland). The Whitehaven Regional Offset Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated.

The offset package also meets the draft Commonwealth offset principles in that:-

- the offset package is a direct package (Principle 4) that is targeted to the EPBC Act matters that are being impacted and determined to be a controlled action (Principle 1), are on a like for like basis (Principle 5):
    - 784 White Box – Yellow Box –Blakely's Red Gum grassy woodland and derived native grassland biodiversity credits (equivalent to 75 ha of the CEEC are being retired to offset impacts to 5.9 ha of intact White Box along Wean Road and Jaeger Lane and 10.9 ha of derived native grassland within the mine site boundary), an offset ratio of 4.46:1;
    - an additional 618 White Box credits, equivalent to 59.4 ha is being protected to offset impacts to other non EPBC Act listed vegetation communities, i.e. a total area of 134.4 ha of White Box – Yellow Box –Blakely's Red Gum grassy woodland and derived native grassland will be protected which is of an equivalent condition to that being impacted.
    - 525 ha of habitat suitable foraging habitat for the Regent Honeyeater and Swift Parrot will also be protected to replace the loss of 47.04 ha of suitable foraging habitat (intact woodland remnants) as a result of the mine extension and for the replacement for impacts to the original offset areas which provided offsets for approximately 15 ha of the original impacts, a ratio of 8.5:1.
- The Whitehaven Regional Biobank Site will have the highest level of conservation status outside of National Parks (via a registered Biobanking Agreement on title that is currently being assessed by DECCW) (Principles 3 and 7);
- The Whitehaven Regional Biobank Site is to be actively managed via a BioBanking management plan with in-perpetuity management costs held in Trust (Principles 3 and 7);
- The offset area is less than 1 km to the east of the mine site and is therefore in the same general area as the development activity (Principle 6);
- The offset is enforceable and will be monitored and audited in accordance with the Biobank Agreement (Principle 8); and
- The Whitehaven Regional Biobank Site enhances and provides strategic conservation outcomes to the west of the Kelvin CCA Zone 2 Aboriginal Area and provides protection to vegetation types not well represented in the existing reserve system (White Box Grassy Woodland). The Whitehaven Regional Offset Site also enhances north-south connectivity on a regional scale and will eventually form part of an east-west link with Vickery State Forest once the Rocglen Coal Mine is rehabilitated (Principle 2).

In summary, the proposed Biodiversity Offset Strategy compensates for the direct loss of 95.44 ha of vegetation in various condition states (intact and DNG) and replacement offsets for impacts to 47.9 ha of the 131.74 ha of approved offsets on a 'like for like' basis with over 525 ha of vegetation in the Whitehaven Regional Biobank Site. The Biodiversity Offset Strategy provides an offset (525 ha) to impact (110.44 ha comprising 95.44 ha of impacts for mine extension and the equivalent of 15 ha of

original impacts which now needs a replacement offset) ratio of 4.75:1 with details of credits to be retired from the Whitehaven Regional Biobank Site outlined in Table 12.

The improvements in conservation values at the Whitehaven Regional Biobank Site (through the cessation of current grazing and implementation of conservation management practices outlined in the Biobank Site Management Plan, including enhancement tree and shrub planting and weed control) will lead to an '*improve and maintain*' conservation outcome.

The retirement of these credits, brings the total number of credits proposed to be retired from the Regional Biobank Site to 10,154 of the total 13,754 generated (ELA 2010) or 73.83% (Table 13). This effectively triggers the 80% of credits sold clause and requires the "active" as well as "passive" management actions to be implemented in accordance with the Biobanking Agreement (3).

Table 12: Proposed vegetation types and number of credits to be retired from the Whitehaven Regional Biobank Site

Offsets for EPBC Act listed threatened communities are highlighted in yellow.

VEGETATION TYPE IMPACTED	CREDITS REQURIED	'LIKE FOR LIKE" EQUIVABLENT OFFSET AREA VEGETATION TYPES	CREDITS AVAILABLE AT THE WHITEHAVEN REGIONAL OFFSET SITE (CUMULATIVE BY TYPE)	CREDITS TO BE RETIRED
Brigalow – Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)	6*	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	1,402	6
Pilliga Box – Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone	1,793	Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	1,820	720
		White Box – White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	2,822	1,073
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	1,712	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	1,396	612
		Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	1,100	1,100
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	784	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	784	784
White Cypress Pine – Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	564	White Cypress Pine – Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	2,415	564
Total	**4,859**			**4,859**

Table 13: Credits remaining at the Whitehaven Regional Offset Site after the implementation of this Biodiversity Offset Strategy:

VEGETATION TYPE	CREDITS GENERATED AT BIOBANK SITE	CREDITS AVAILABLE	CREDITS TO BE RETIRED	CREDITS REMAINING AFTER RETIREMENT
Semi-evergreen vine thicket of basalt hills of the NSW north western slopes	1,977	1,820	1,820	0
White Box – White Cypress Pine shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	3,627	2,822	1,073	1,749
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	3,216	1,402	1,402	0
White Cypress Pine – Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	4,934	2,415	564	1,851
Total	**13,754**	**8,459**	**4,859**	**3,600**

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Appendix 1: BioMetric Condition Assessment

VEGETATION CONDITION ASSESSMENT

Full floristic BioBanking vegetation plots (20 m x 50 m) were undertaken in as many patches of vegetation across the project site as practicable to determine the BioMetric site condition scores against benchmarks for each vegetation types and inform the '*maintain or improve*' assessment. A total of 8 plots were completed across the mine site and an additional 15 were completed in adjoining properties (potential offset sites) in order to adequately assess the condition of the vegetation. Within each plot, the native species richness; native and exotic species cover; hollow bearing trees; over-storey regeneration; and length of fallen logs were assessed. Native cover in each structural layer was visually estimated in accordance with the BioBanking Methodology.

PLOT	1	2	3	4	5	6	7	8	15*
Vegetation Type	Brigalow	White Box	Piliga Box	White Cypress Pine	Cleared	White Box	White Box DNG	Poplar Box DNG	Polar Box
Condition	Mod-Good	Mod-Good	Mod-Good	Mod-Good	Cleared	Mod-Good	DNG	DNG	Mod-Good
Native Plant Species Richness	3	29	29	43	12	37	27	20	30
Native Over-storey Cover (%)	24	26.6	16	18.5	0	34.5	0	0	15.5
Native Mid-storey Cover (%)	4.5	22.5	4	0.5	0	21.5	0	0	12
Native Ground Cover-grasses (%)	10	6	42	42	26	32	64	24	10
Native Ground Cover-shrubs (%)	2	6	2	2	4	0	0	2	0
Native Ground Cover-other (%)	6	0	6	14	0	34	26	22	20

Exotic Plant Cover (%)	32	8	4	0	76	44	80	24	0
Number of Trees with Hollows	0	1	0	0	0	2	0	0	3
Over-storey Regeneration	0	0	0	1	0	0	0	0	0
Total Length of Fallen Logs (m)	35	36	13	64	0	74	0	0	30

** Plot 15 was surveyed on a neighbouring property in the same vegetation type and condition state*

The condition of vegetation at the project site varied from remnant woodland, disturbed woodland, derived native grasslands and exotic pasture. All native vegetation mapped as part of this project is categorised as being in 'moderate to good' condition according to the BioBanking Methodology.

EPBC Act Condition Assessment

As discussed in Section 2.4, a quantitative assessment of the presence/absence of the EPBC Act listed Critically Endangered Ecological Community White Box – Yellow Box – Blakely's Red Gum grassy woodland and derived native grassland was undertaken during the field inspection. The results of this assessment are outlined in the table below.

As can be seen from this table, three plots met the minimum requirement to be classified as the EPBC Act listed community. It should be noted that Plot 2 and Plot 6 met all the structural requirements of this community, while Plot 7 consisted primarily of "derived native grasslands" which have had their canopy, shrub and mid layers removed. The vegetation in Plot 2 and Plot 6 is considered to be in moderate to good condition while the vegetation in Plot 7 is considered to be in poorer condition. Despite a large cover (80%) of exotic species in Plot 7, this plot still meets the EPBC Act assessment requirements as the majority of this exotic cover consisted of annual species which are excluded from the assessment.

Criteria	Plot 1	Plot 2	Plot 3	Plot 4	Plot 5	Plot 6	Plot 7	Plot 8
Is, or was previously, at least one of the most common overstorey species White Box, Yellow Box or Blakely's Red Gum (or Western Grey Box or Coastal Grey Box in the Nandewar	No. Not the listed community	Yes	No. Not the listed community	No. Not the listed community	No. Not the listed community	Yes	Yes	No. Not the listed community

Bioregion?								
Does the patch have a predominantly native understorey?		Yes				Yes	Yes	
Is the patch 0.1ha or greater in size		Yes				Yes	Yes	
There are 12 or more native understorey species present (excluding grasses). There must be at least one important species.		Yes. Plot 2 had 29 native species present which included at least 12 native understorey species present (excluding grasses). The important species *Calotis lappulacea* and *Dichopogon fimbriatus* were recorded in this patch.				Yes. Plot 6 had 37 native species present which included at least 12 native understorey species present (excluding grasses). The important species *Calotis lappulacea* and *Dichopogon fimbriatus* were recorded in this patch.	Yes. Plot 7 had 27 native species present which included at least 12 native understorey species present (excluding grasses). The important species *Calotis lappulacea* and *Dichopogon fimbriatus* were recorded in this patch.	
Qualifies as the EPBC Act listed community?	No	Yes.	No.	No.	No.	Yes	Yes	No.

Plot 1: Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)

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

Plot 3: Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone

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

Plot 5: Cleared

Plot 6: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Plot 7: White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (DNG)

Plot 8: Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) (DNG)

Plot 15: Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) Located on adjoining property “Yarrawonga”

Appendix 2: NSW Offsetting Principles

These offset principles are from the DECCW website (30/5/2010):

1 Impacts must be avoided first by using prevention and mitigation measures.

Offsets are then used to address remaining impacts. This may include modifying the proposal to avoid an area of biodiversity value or putting in place measures to prevent offsite impacts.

2. All regulatory requirements must be met.

Offsets cannot be used to satisfy approvals or assessments under other legislation, e.g. assessment requirements for Aboriginal heritage sites, pollution or other environmental impacts (unless specifically provided for by legislation or additional approvals).

3. Offsets must never reward ongoing poor performance.

Offset schemes should not encourage landholders to deliberately degrade or mismanage offset areas in order to increase the value from the offset.

4. Offsets will complement other government programs.

A range of tools is required to achieve the NSW Government's conservation objectives, including the establishment and management of new national parks, nature reserves, state conservation areas and regional parks and incentives for private landholders.

5. Offsets must be underpinned by sound ecological principles.

They must:

- include the consideration of structure, function and compositional elements of biodiversity, including threatened species
- enhance biodiversity at a range of scales
- consider the conservation status of ecological communities
- ensure the long-term viability and functionality of biodiversity.

Biodiversity management actions, such as enhancement of existing habitat and securing and managing land of conservation value for biodiversity, can be suitable offsets. Reconstruction of ecological communities involves high risks and uncertainties for biodiversity outcomes and is generally less preferable than other management strategies, such as enhancing existing habitat.

6. Offsets should aim to result in a net improvement in biodiversity over time.

Enhancement of biodiversity in offset areas should be equal to or greater than the loss in biodiversity from the impact site.

Setting aside areas for biodiversity conservation without additional management or increased security is generally not sufficient to offset against the loss of biodiversity. Factors to consider include protection of existing biodiversity (removal of threats), time-lag effects, and the uncertainties and risks associated with actions such as revegetation.

Offsets may include enhancing habitat, reconstructing habitat in strategic areas to link areas of conservation value, or increasing buffer zones around areas of conservation value and removal of threats by conservation agreements or reservation.

7. Offsets must be enduring & they must offset the impact of the development for the period that the impact occurs.

As impacts on biodiversity are likely to be permanent, the offset should also be permanent and secured by a conservation agreement or reservation and management for biodiversity. Where land is donated to a public authority or a private conservation organisation and managed as a biodiversity offset, it should be accompanied by resources for its management. Offsetting should only proceed if an appropriate legal mechanism or instrument is used to secure the required actions.

8. Offsets should be agreed prior to the impact occurring.

Offsets should minimise ecological risks from time-lags. The feasibility and in-principle agreements to the necessary offset actions should be demonstrated prior to the approval of the impact. Legal commitments to the offset actions should be entered into prior to the commencement of works under approval.

9. Offsets must be quantifiable & the impacts and benefits must be reliably estimated.

Offsets should be based on quantitative assessment of the loss in biodiversity from the clearing or other development and the gain in biodiversity from the offset. The methodology must be based on the best available science, be reliable and used for calculating both the loss from the development and the gain from the offset. The methodology should include:

- the area of impact
- the types of ecological communities and habitat/species affected
- connectivity with other areas of habitat/corridors
- the condition of habitat
- the conservation status and/or scarcity/rarity of ecological communities
- management actions
- level of security afforded to the offset site.
- the best available information/data should be used when assessing impacts of biodiversity loss and gains from offsets. Offsets will be of greater value where:
- they protect land with high conservation significance
- management actions have greater benefits for biodiversity
- the offset areas are not isolated or fragmented
- the management for biodiversity is in perpetuity (e.g. secured through a conservation agreement).
- management actions must be deliverable and enforceable.

10. Offsets must be targeted.

They must offset impacts on the basis of like-for-like or better conservation outcome. Offsets should be targeted according to biodiversity priorities in the area, based on the conservation status of the ecological community, the presence of threatened species or their habitat, connectivity and the potential to enhance condition by management actions and the removal of threats. Only ecological communities that are equal or greater in conservation status to the type of ecological community lost can be used for offsets. One type of environmental benefit cannot be traded for another: for example, biodiversity offsets may also result in improvements in water quality or salinity but these benefits do not reduce the biodiversity offset requirements.

11. Offsets must be located appropriately.

Wherever possible, offsets should be located in areas that have the same or similar ecological characteristics as the area affected by the development.

12. Offsets must be supplementary.

They must be beyond existing requirements and not already funded under another scheme. Areas that have received incentive funds cannot be used for offsets. Existing protected areas on private land cannot be used for offsets unless additional security or management actions are implemented. Areas already managed by the government, such as national parks, flora reserves and public open space cannot be used as offsets.

13. Offsets and their actions must be enforceable through development consent conditions, licence conditions, conservation agreements or a contract.

Offsets must be audited to ensure that the actions have been carried out, and monitored to determine that the actions are leading to positive biodiversity outcomes.

Appendix 3: Draft Commonwealth Offsetting Principles

Commonwealth (DEWR 2007)

While the Commonwealth do not have a formal methodology for calculating offset requirements, there are draft policies in place that provide the principles deemed appropriate when offsetting the impact of vegetation clearance (DEWR 2007). The Australian Government's position is summarised as follows.

1. Environmental offsets should be targeted to the matter protected by the EPBC Act that is being impacted.

2. A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.

3. Environmental offsets should deliver a real conservation outcome.

4. Environmental offsets should be developed as a package of actions – which may include both direct and indirect offsets.

5. Environmental offsets should, as a minimum, be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.

6. Environmental offsets should be located within the same general area as the development activity.

7. Environmental offsets should be delivered in a timely manner and be long lasting.

8. Environmental offsets should be enforceable, monitored and audited.

This policy identifies two kinds of biodiversity offset, 'direct offsets' including such measures as long-term protection of existing habitat, and 'indirect offsets' for such measures as implementing recovery plan actions or contributions to relevant research.

The proposed LOM Project BOS has been designed to meet the nominated principles and goals of both the NSW and Commonwealth jurisdictions.

Appendix 4: Indicative Credit Report for the Previously Approved Biodiversity Offset areas

BioBanking
Biodiversity Banking and Offsets Scheme

Biobanking Agreement Credit Report

This report identifies the number and type of credits that may be created at a BIOBANK SITE.

Date of report: 03/11/2010 Time: 14:43 Tool Version: 1.1

Property Details

Proposal ID: 0027/2010/B004

Biobank Name: Rocglen Coal Mine

Biobank Location: Rocglen Coal Mine is located on Wean Road approximately 25 km north of

Biobank Adress: Wean Road

CMA: Namoi

Landholder Name: Whitehaven Coal Limited

Landholder Address: PO Box 600

Landholder Phone: (02) 6742 4215

Assessor Name: Martin Sullivan

Assessor Address: Suite 604, level 6, 267 Castlereagh St. Sydney 2000

Assessor Phone: (02) 9993 0566

Assessor Accreditation Number:0027

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

- ☐ **All or part of the biobank site is covered by a covenant, has received govt funding or is crown land**
- ☐ **Local reference data is required for the following vegetation zones**
- ☐ **Expert Report for the following species:**
- ☑ **Justification for request of additional increase in site value score with management for the following vegetation zones:**

  Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)

  Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)

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

- ☑ **The minimium number of plots were not entered for the following vegetation zones**

  Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)

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Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)

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

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

Ecosystem Credits

Vegetation Type	Area (ha)	Credits created
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)	25.2	303
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)	8.9	72
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	2.6	19
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	0.9	8
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	8.8	65
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	5.3	40

Credit Profile

Group 1 : Ecosystem credits: 303 credits

CMA	Namoi
CMA Sub-region	Liverpool Plains (Part B) (871)
Vegetation type	Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)
Surrounding vegetation cover class	31-70%
Patch size, including low condition	>100 ha

Total area of Vegetation zone(s) included in this group: 25.2 ha

Group 2 : Ecosystem credits: 72 credits

CMA	Namoi
CMA Sub-region	Liverpool Plains (Part B) (871)
Vegetation type	Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)
Surrounding vegetation cover class	31-70%
Patch size, including low condition	0 - 5 ha

Total area of Vegetation zone(s) included in this group: 8.9 ha

Group 3 : Ecosystem credits: 19 credits

CMA	Namoi
CMA Sub-region	Liverpool Plains (Part B) (871)
Vegetation type	Poplar Box grassy woodland on alluvial heavy

	clay soils in the Brigalow Belt South Bioregion (Benson 101)
Surrounding vegetation cover class	31-70%
Patch size, including low condition	0 - 5 ha

Total area of Vegetation zone(s) included in this group: 2.6 ha

Group 4 : Ecosystem credits: 8 credits

CMA	Namoi
CMA Sub-region	Liverpool Plains (Part B) (871)
Vegetation type	White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions
Surrounding vegetation cover class	31-70%
Patch size, including low condition	>100 ha

Total area of Vegetation zone(s) included in this group: 0.9 ha

Group 5 : Ecosystem credits: 65 credits

CMA	Namoi
CMA Sub-region	Liverpool Plains (Part B) (871)
Vegetation type	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion
Surrounding vegetation cover class	31-70%
Patch size, including low condition	>100 ha

Total area of Vegetation zone(s) included in this group: 8.8 ha

Group 6 : Ecosystem credits: 40 credits

CMA	Namoi
CMA Sub-region	Liverpool Plains (Part B) (871)
Vegetation type	White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion
Surrounding vegetation cover class	31-70%
Patch size, including low condition	0 - 5 ha

Total area of Vegetation zone(s) included in this group: 5.3 ha

Species Credits

Additional Management Actions

The following management actions are required at the property. These actions are in addition to the standard management actions required at the property

Cat and/or Fox control	
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	8.9 ha
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	25.2 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) (NA185)	2.6 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)	0.9 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	1.5 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	3.8 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	8.8 ha
Control feral pigs	
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	25.2 ha
Exclude miscellaneous feral species	
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	8.9 ha
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	25.2 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) (NA185)	2.6 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)	0.9 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	1.5 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	3.8 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	8.8 ha

Feral and/or native herbivore control/ exclusion (eg rabbit, goats, deer etc)	
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	8.9 ha
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)	25.2 ha
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) (NA185)	2.6 ha
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions (NA226)	0.9 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	1.5 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	3.8 ha
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion (NA228)	8.8 ha

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Appendix 5: Indicative Credit Report for the Rocglen Coal Mine Extension Project

BioBanking
Biodiversity Banking and Offsets Scheme

Biobanking Credit Report

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

Date of report: 03/11/2010 Time: 16:16 Tool Version: 1.1

Development Details

Proposal ID: 0027/2010/D003

Development Name: Rocglen Coal Mine
Development Location: Wean Road, approximately 25m north of Gunnedah
Development Address: Warn Road

CMA: Namoi

Proponent Name: Whitehaven Coal Limited
Proponent Address: PO Box 600
Proponent Phone: (02) 6742 4215

Assessor Name: Martin Sullivan
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Assessor Phone: (02) 9993 0566
Assessor Accreditation Number: 0027

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 minimium number of plots were not entered for the following vegetation zones**

Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)

Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)

Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)

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

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

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

Department of Environment & Climate Change NSW

Improving or maintaining biodiversity values

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

Red Flag	Reason
Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)	Vegetation type being > 70% cleared; Vegetation type contains an endangered ecological community;
Pilliga Box – Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)	Vegetation type being > 70% cleared;
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)	Vegetation type being > 70% cleared;
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
Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35) [NA117]	0.3	11	Yes
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) [NA179]	27.9	1,418	Yes
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) [NA185]	37.5	1,480	Yes
Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) [NA185]	3.4	213	Yes
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions [NA226]	10.9	407	Yes
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions [NA226]	5.9	369	Yes
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion [NA228]	9.7	488	No

Credit Profiles

Group: 1 Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35)

Ecosystem credits: 11 credits

Total area of vegetation(s): 0.25 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained.	Description: Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 10%	**Minimum area: 0 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)	Brigalow - Belah woodland on alluvial often gilgaied clay soil mainly in the Brigalow Belt South Bioregion (Benson 35) (NA117)
Liverpool Plains (Part B)	
Pilliga (Part A)	

Pilliga Outwash

Group: 2 Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88)

Ecosystem credits: 1,418 credits

Total area of vegetation(s): 27.9 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained.	Description: Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 10%	**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)	Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams mainly of the temperate (hot summer) climate zone (Benson 88) (NA179)
Liverpool Plains (Part B)	

Group: 3 Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)

Ecosystem credits: 1,480 credits

Total area of vegetation(s): 37.5 ha

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

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A)	Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) (NA185)
Liverpool Plains (Part B)	
Pilliga (Part B)	

Group: 4 Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101)

Ecosystem credits: 213 credits

Total area of vegetation(s): 3.4 ha

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

Namoi

CMA Sub-Region(s)	Veg Type(s)
Liverpool Plains (Part A)	Poplar Box grassy woodland on alluvial heavy clay soils in the Brigalow Belt South Bioregion (Benson 101) (NA185)
Liverpool Plains (Part B)	
Pilliga (Part B)	

Group: 5 White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions

Ecosystem credits: 407 credits

Total area of vegetation(s): 10.9 ha

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

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

Ecosystem credits: 369 credits

Total area of vegetation(s): 5.9 ha

1. Surrounding vegetation cover	2. Patch size, including low condition
Description: Minimum surrounding vegetation cover in which the credits must be obtained.	Description: Minimum area of contiguous vegetation in which credits must be obtained.
Minimum percent cover: 10%	**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: 7 White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion

Ecosystem credits: 488 credits

Total area of vegetation(s): 9.7 ha

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

Species Credits

eco logical AUSTRALIA

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