NARRABRI UNDERGROUND MINE STAGE 3 EXTENSION PROJECT

BIODIVERSITY IMPACT REDUCTION AND OFFSET REPORT

SEPTEMBER 2021
Project No. WHC-17-54
Document No. 01102688

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EXECUTIVE SUMMARY

Narrabri Coal Operations Pty Ltd (NCOPL) is seeking a new Development Consent under the State Significant Development provisions of Part 4 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* for the Narrabri Underground Mine Stage 3 Extension Project (the Project). The Project involves an extension to the south of the approved underground mining area within Mining Lease Application areas 1 and 2, an extension of the mine life to 2044 and development of supporting surface infrastructure.

The conditions of the approval (if granted) would require NCOPL to retire biodiversity credits to offset the residual impact on biodiversity values (whether of the number and class specified in the Project Biodiversity Development Assessment Report or of another number and class) to the satisfaction of the NSW Secretary of the Department of Planning, Industry and Environment (DPIE).

A key outcome from planning the design of the Project is that NCOPL proposes to forgo clearance of native vegetation within a portion of existing/approved Narrabri Mine Stage 2 surface infrastructure along Longwalls 206 to 209 (not yet constructed or required for the Project). This area is referred to as the Impact Reduction Area. The existing Narrabri Mine (Stage 2) Project Approval 08_0144 would be surrendered if the Project is approved (i.e. the new Development Consent would consolidate/replace the current Project Approval).

NCOPL consulted with Biodiversity Conservation and Science (BCS) on 10 December 2019 and 25 June 2020 and DPIE on 11 December 2020 in relation to the assessment of the Impact Reduction Area. In March 2021, DPIE and BCS requested that the Impact Reduction Area be assessed in a separate stand-alone document and accepted the approach of determining the biodiversity value (number of credits if it were to be impacted) of the Impact Reduction Area using the Biodiveristy Assessment Method.

This Biodiversity Impact Reduction and Offset Report has been prepared to:

- calculate the biodiversity credits that would otherwise be needed if the Impact Reduction Area was to be cleared, so DPIE can consider these relinquished credits in assessment and evaluation of the Project, and in setting the credit requirements for the Project; and
- describe the existing biodiversity offset areas for the Narrabri Mine.

As a result of running the Biodiversity Assessment Method Calculator, the Impact Reduction Area (if it were to be cleared) is equivalent to a total of 292 ecosystem credits and 2,056 species credits (Table ES-1). NCOPL seeks from DPIE that these credits will be discounted from the credit liability for the Project.

Existing offset areas for the Narrabri Mine have been subject to management since 2014. Management activities undertaken in the offset areas include, weed control via spraying, feral animal management via baiting and trapping, and firebreak maintenance.

The on-site offset areas have been secured (since 7 June 2021), under various Conservation Agreements under Part 4 Division 12 of the *National Parks and Wildlife Act 1974*. The Kenna offset area has also been secured under a Conservation Agreement (VCA0468) since 27 June 2019. The future on-site offset area would be included in the Project rehabilitation strategy as shown on Figure 12 in accordance with the Biodiversity Offset Strategy.

Table ES-1
Biodiversity Credits Generated by Impact Reduction

Credit Type	Total Area	Credits Generated
Ecosystem Credits	14.1 hectares (ha) of native vegetation	292
Species Credits		
Tylophora linearis	13.9 ha of habitat*	387
Pale-headed Snake	13.9 ha of habitat*	387
Glossy Black-Cockatoo	13.9 ha of habitat*	387
Koala	13.9 ha of habitat*	387
Eastern Pygmy-possum	13.9 ha of habitat*	387
Squirrel Glider	4.5 ha of habitat*	121
	Total Ecosystem Credits	**292**
	Total Species Credits	**2,056**

* The species habitats overlap (i.e. the habitats are not mutually exclusive).

1 INTRODUCTION

1.1 BACKGROUND

The Narrabri Mine is located approximately 25 kilometres (km) south-east of Narrabri and approximately 60 km north-west of Gunnedah within the Narrabri Shire Council Local Government Area of New South Wales (NSW) (Figure 1). The Narrabri Mine is operated by Narrabri Coal Operations Pty Ltd (NCOPL). The approved Narrabri Mine indicative surface disturbance footprint is shown on Figure 2.

NCOPL is seeking a new Development Consent under the State Significant Development provisions of Part 4 of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) and approval under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) for the Narrabri Underground Mine Stage 3 Extension Project (the Project). The Project involves an extension to the south of the approved underground mining area to gain access to additional coal reserves within Mining Lease Application areas 1 and 2, an extension of the mine life to 2044 and development of supporting surface infrastructure (Figure 3). A detailed description of the Project is provided in Section 2 in the Main Report of the Environmental Impact Statement (EIS).

A key outcome from planning the design of the Project is that NCOPL proposes to forgo clearance of native vegetation within a portion of existing/approved Narrabri Mine Stage 2 surface infrastructure along Longwalls 206 to 209 (not yet constructed or required for the Project). This area is referred to as the Impact Reduction Area (Figure 4). The existing Narrabri Mine (Stage 2) Project Approval 08_0144 would be surrendered if the Project is approved (i.e. the new Development Consent would consolidate/replace the current Project Approval).

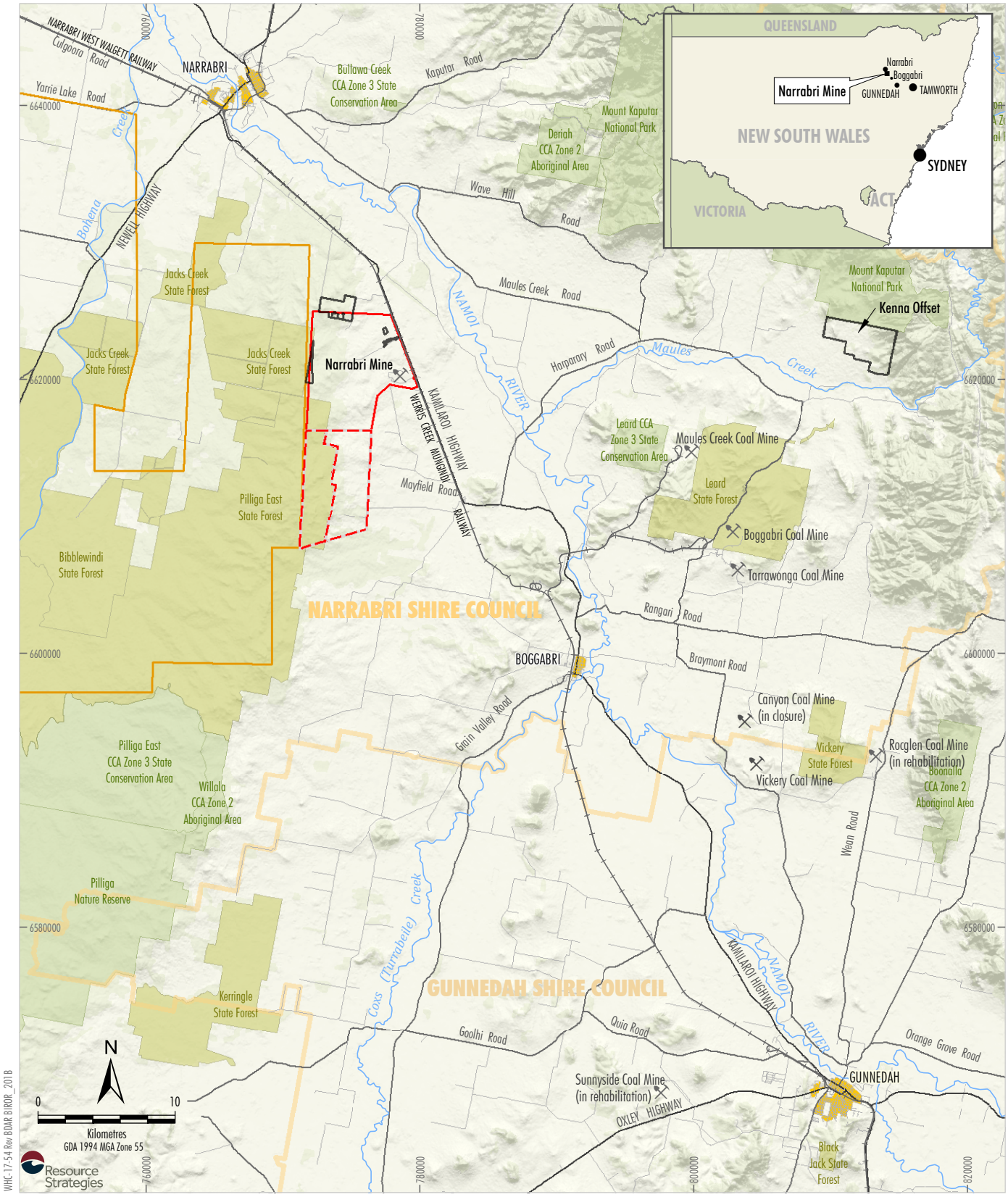
1.2 ASSESSMENT APPROACH

NCOPL consulted with Biodiversity Conservation and Science (BCS) on 10 December 2019 and 25 June 2020 and DPIE on 11 December 2020 in relation to the assessment of the Impact Reduction Area. In March 2021, DPIE and BCS requested that requested the Impact Reduction Area be assessed in a separate stand-alone document and accepted the approach of determining the biodiversity value (number of credits if it were to be impacted) of the Impact Reduction Area using the Biodiveristy Assessment Method.

This document has been prepared to:

- calculate the biodiversity credits that would otherwise be needed if the Impact Reduction Area was to be cleared, so the Department of Planning, Industry and Environment (DPIE) can consider these relinquished credits in assessment and evaluation of the Project, and in setting the credit requirements for the Project; and
- describe the existing biodiversity offset areas for the Narrabri Mine and the proposed offset strategy for the Project.

The Biodiversity Assessment Method (BAM) Calculator (App last updated: 22/10/2020 [Version: 1.3.0.00]; BAM data last updated: 10/06/2021 [Version: 45]) was used in this assessment.



LEGEND

- Mine Site
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Local Government Boundary
- State Forest
- State Conservation Area, Aboriginal Area
- Narrabri Gas Project (Santos NSW [Eastern] Pty Ltd)
- Narrabri Mine Existing Offset Area

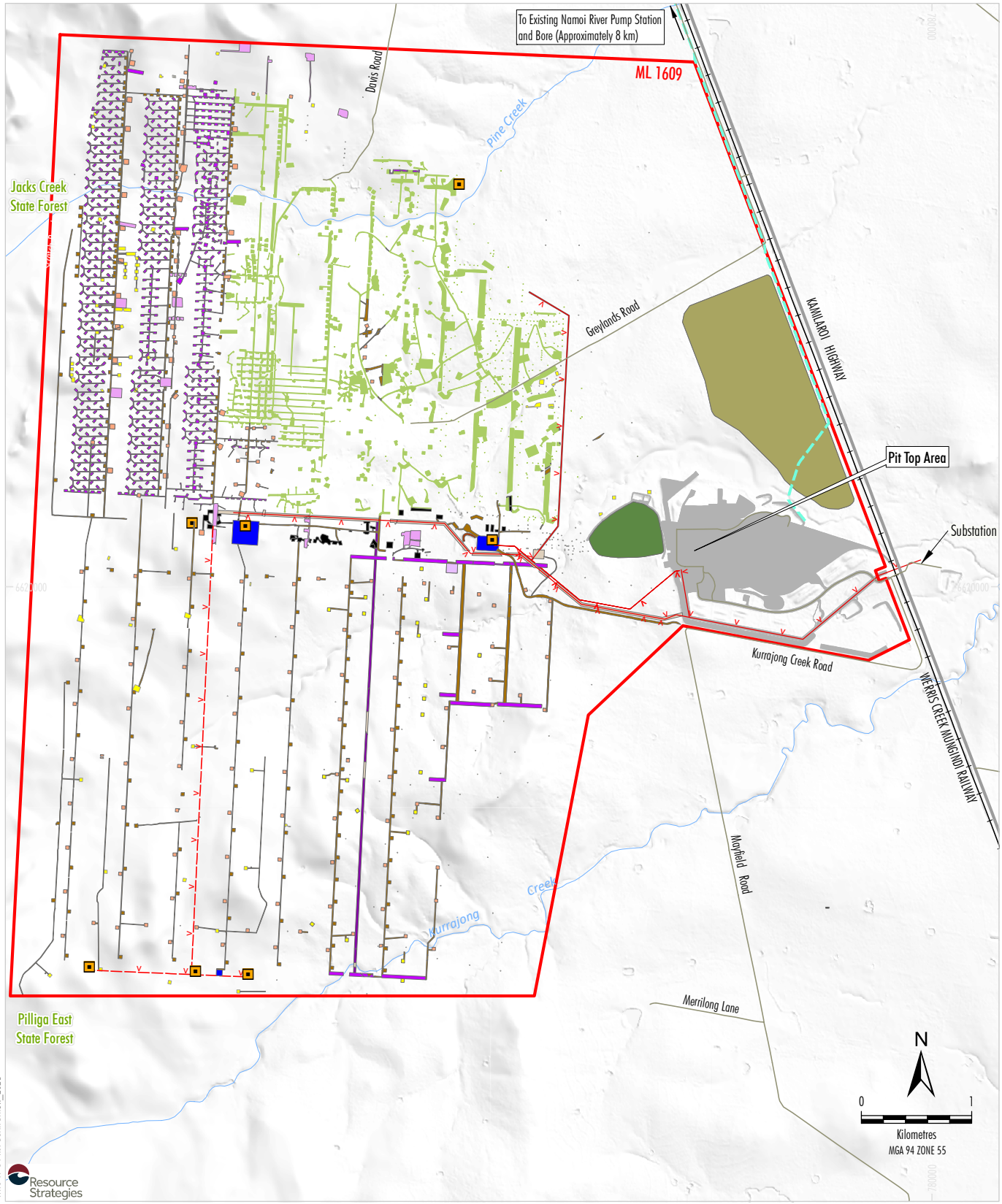
Source: Geoscience Australia (2011); NSW Spatial Services (2019)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Regional Location

Figure 1



LEGEND

- Mining Lease (ML 1609)
- Approved Narrabri Mine
- Electricity Transmission Line (Constructed)
- Electricity Transmission Line (Not Yet Constructed)
- Existing Namoi River Pipeline (Buried)
- Indicative Ventilation Complex
- Indicative Ventilation Complex - Decommissioned
- Existing Rehabilitation and Subsidence Remediation Areas
- Reject Emplacement Area
- Additional Brine Storage Area
- Exploration Borehole
- Access Track and Post-drainage Corridor
- Bund
- Pre-conditioning Area
- SIS Pre-drainage Borehole
- Service Borehole
- Services Corridor
- Pit Top Area Infrastructure
- Ventilation Complex
- Other

Source: NCOPL (2019); NSW Spatial Services (2019)

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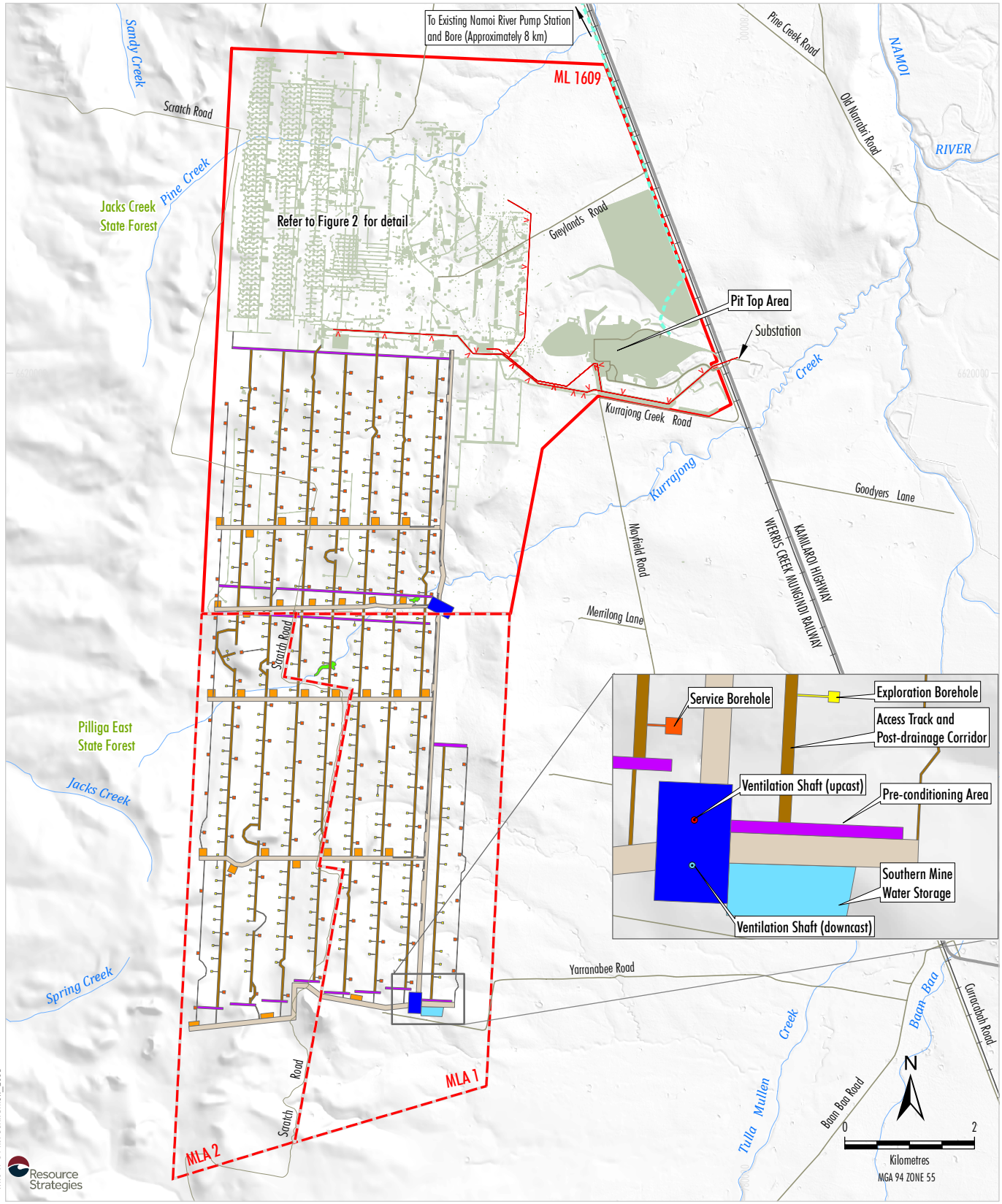
NARRABRI STAGE 3 PROJECT

Approved Narrabri Mine
Indicative Surface Disturbance Footprint

Figure 2



LEGEND

- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Electricity Transmission Line (Constructed)
- Existing Namoi River Pipeline (Buried)

- Existing/Approved Surface Development*
- Services Corridor
- Service Borehole
- Exploration Borehole
- Access Track and Post-drainage Corridor
- Pre-conditioning Area
- Service Borehole and Power Reticulation
- Southern Mine Water Storage
- Ventilation Complex
- Farm Dam Decommissioning Works

*Excludes the Impact Reduction Area (Refer to Figure 4)

Source: NCOPL (2019); NCOPL (2021); NSW Spatial Services (2019)

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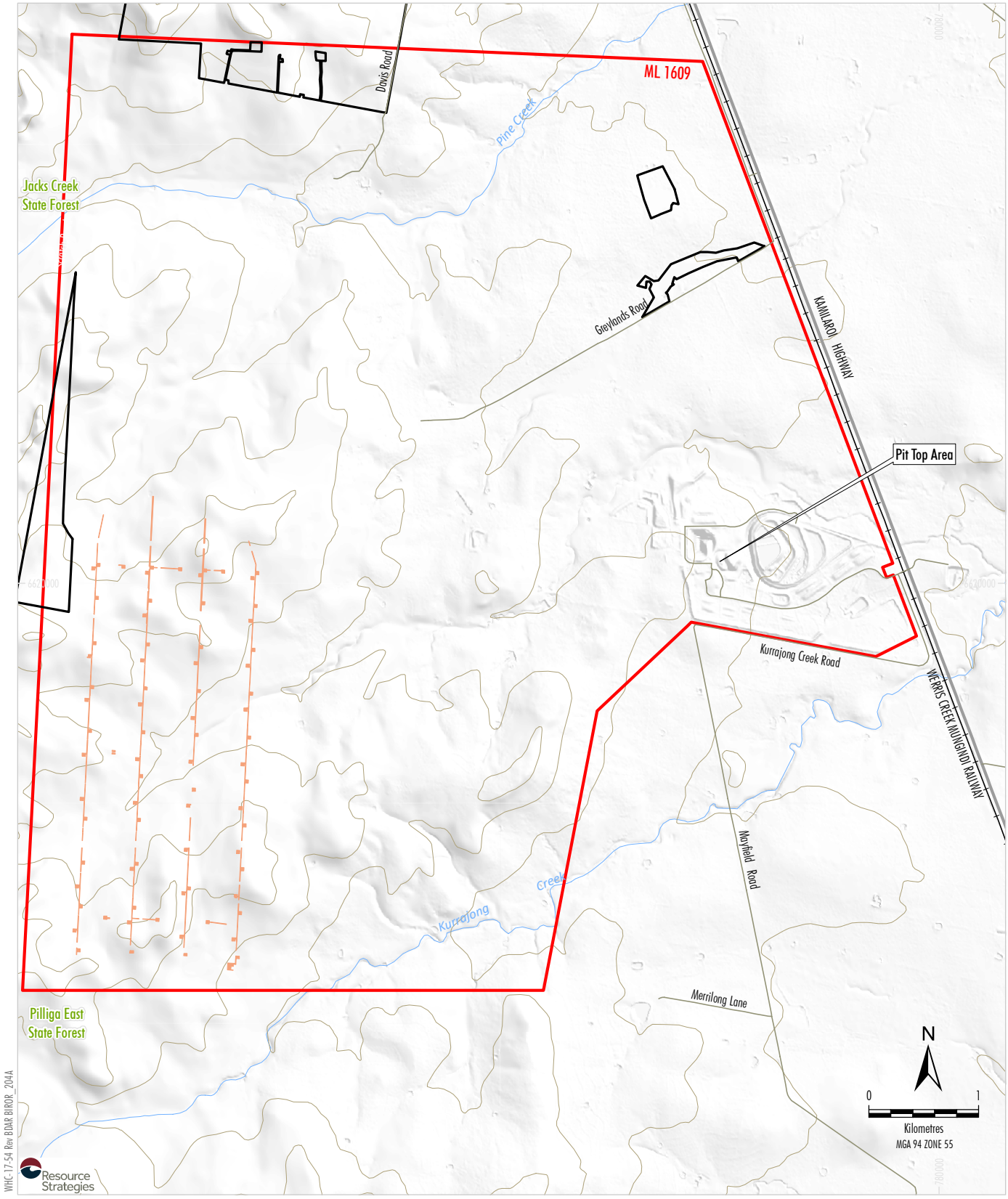
NARRABRI STAGE 3 PROJECT

Project General Arrangement - Indicative Surface Development Footprint

Figure 3



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LEGEND

- Mining Lease (ML 1609)
- Indicative Approved Surface Development (Impact Reduction Area)
- Narrabri Mine Existing Offset Area

Source: NCOPL (2019); NSW Spatial Services (2019)

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NARRABRI STAGE 3 PROJECT

Impact Reduction Area
Development Footprint

Figure 4

2 CREDIT CALCULATION

In order to calculate the residual biodiversity impacts of the proposed development, the biodiversity credits that would otherwise be needed to offset clearance of the Impact Reduction Area have been calculated in this section. The total approved disturbance area to be relinquished is 14.1 hectares (ha). The Impact Reduction Area is shown on Figure 4.

2.1 FIELD SURVEYS

The flora and fauna survey effort for the Project and Impact Reduction Area was substantial and undertaken in accordance with relevant State and Commonwealth survey guidelines. In addition to the previous surveys and monitoring programmes at the operating mine site, AMBS Ecology and Heritage (AMBS) (2020a and 2020b) collected the relevant ecological survey data in accordance with the BAM (DPIE, 2020). Nine flora field surveys were undertaken by AMBS in June, July, August and October 2019 and January 2020, in addition to four prior flora surveys undertaken in September, October and November 2017 and January 2018 by Eco Logical Australia (ELA). Seven fauna field surveys were undertaken by AMBS in June, July, August, October and December 2019 and January 2020, in addition to three prior fauna surveys undertaken in August, September, October and November 2017 and February 2018 by ELA. The methods and results of these surveys are all provided in AMBS (2020a and 2020b).

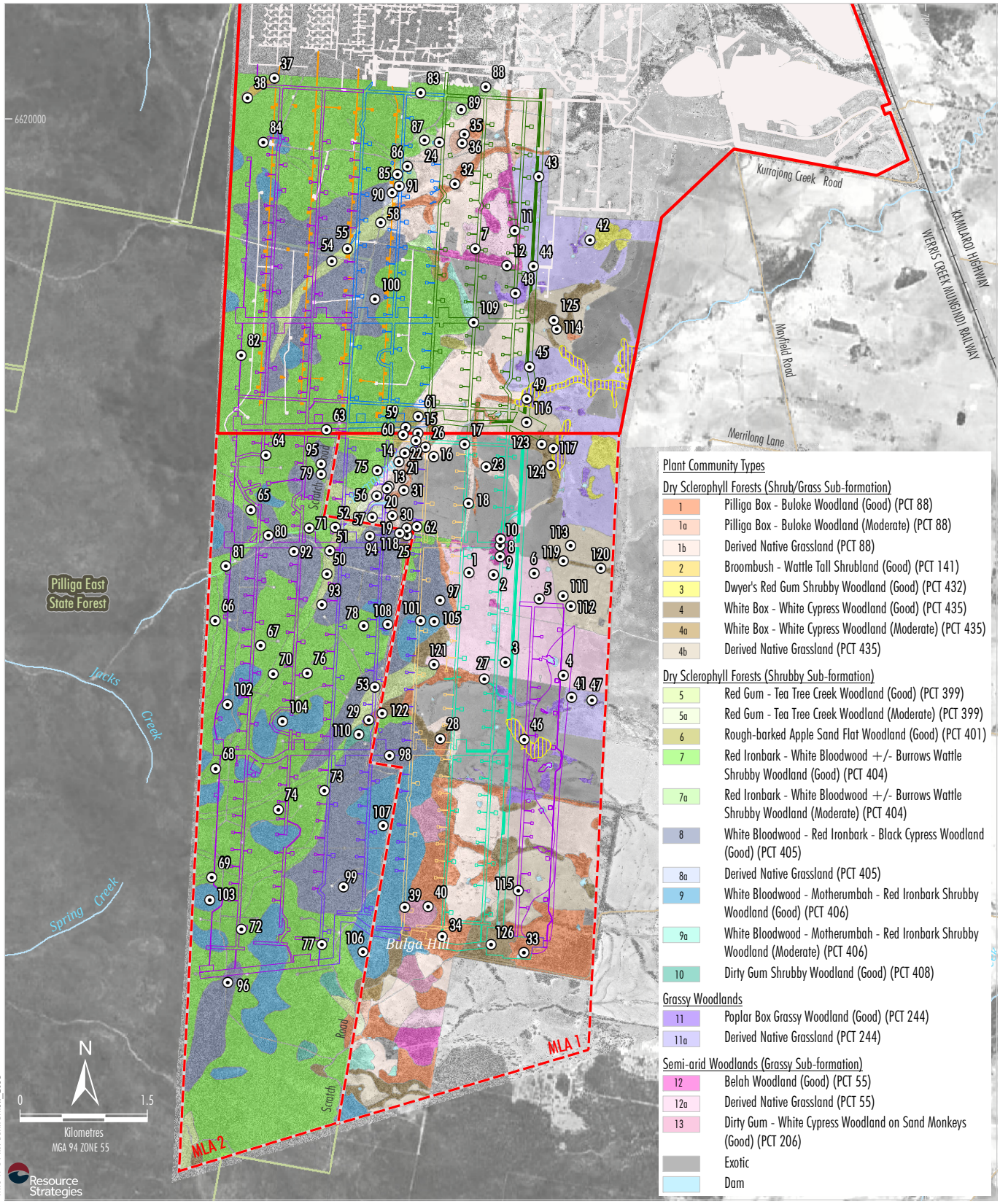
2.2 PLANT COMMUNITY TYPES

The Impact Reduction Area covers approximately 14.1 ha of native vegetation, comprising 13.9 ha of woodland and 0.2 ha of derived native grassland (DNG) (Table 1) (Figure 5).

Seven vegetation zones (i.e. areas of native vegetation that are the same Plant Community Type [PCT] and similar broad condition states) are mapped. All of these zones are also mapped within and of the same condition as vegetation in the Project Development Footprint. The main vegetation community in the Impact Reduction Area is Vegetation Community 7 Red Ironbark – White Bloodwood +/- Burrows Wattle Shrubby Woodland (Good) (PCT 404) (9.5 ha, 68 percent [%]). The 'Percent Cleared Value' for each PCT is listed in Table 1.

Table 1
Plant Community Types within the Impact Reduction Area

Vegetation Zone	Vegetation Community (AMBS, 2020a)	PCT ID and Name		Area (ha)	Percent Cleared in Namoi (DPIE, 2021a)
Dry Sclerophyll Forests (Shrub/grass Sub-formation)					
1b	Derived Native Grassland	88	Pilliga Box – White Cypress Pine – Buloke shrubby woodland in the Brigalow Belt South Bioregion (DNG)	0.1	38% (+/- 80)
Dry Sclerophyll Forests (Shrubby Sub-formation)					
5	Red Gum – Tea Tree Creek Woodland (Good)	399	Red Gum – Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga to Goonoo sandstone forests, Brigalow Belt South Bioregion (Good)	0.5	10% (+/- 50)
5a	Red Gum – Rough-barked Apple – Tea Tree Creek Woodland (Moderate)	399	Red Gum – Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga to Goonoo sandstone forests, Brigalow Belt South Bioregion (Moderate)	0.1	10% (+/- 50)
7	Red Ironbark – White Bloodwood +/- Burrows Wattle Shrubby Woodland (Good)	404	Red Ironbark – White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests (Good)	9.5	9% (+/- 40)
7a	Red Ironbark – White Bloodwood +/- Burrows Wattle Shrubby Woodland (Moderate)	404	Red Ironbark – White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests (Moderate)	0.2	9% (+/- 40)
8	White Bloodwood – Red Ironbark – Black Cypress Woodland (Good)	405	White Bloodwood – Red Ironbark – Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions (Good)	3.6	14% (+/- 30)
8a	Derived Native Grassland	405	White Bloodwood – Red Ironbark – Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions (DNG)	0.1	14% (+/- 30)
			Total Woodland	**13.9**	-
			Total Derived Native Grassland	**0.2**	-
			Total Native Vegetation	**14.1**	-



Plant Community Types

Dry Sclerophyll Forests (Shrub/Grass Sub-formation)

- 1 Pilliga Box - Buloke Woodland (Good) (PCT 88)
- 1a Pilliga Box - Buloke Woodland (Moderate) (PCT 88)
- 1b Derived Native Grassland (PCT 88)
- 2 Broombush - Wattle Tall Shrubland (Good) (PCT 141)
- 3 Dwyer's Red Gum Shrubby Woodland (Good) (PCT 432)
- 4 White Box - White Cypress Woodland (Good) (PCT 435)
- 4a White Box - White Cypress Woodland (Moderate) (PCT 435)
- 4b Derived Native Grassland (PCT 435)

Dry Sclerophyll Forests (Shrubby Sub-formation)

- 5 Red Gum - Tea Tree Creek Woodland (Good) (PCT 399)
- 5a Red Gum - Tea Tree Creek Woodland (Moderate) (PCT 399)
- 6 Rough-barked Apple Sand Flat Woodland (Good) (PCT 401)
- 7 Red Ironbark - White Bloodwood +/- Burrows Wattle Shrubby Woodland (Good) (PCT 404)
- 7a Red Ironbark - White Bloodwood +/- Burrows Wattle Shrubby Woodland (Moderate) (PCT 404)
- 8 White Bloodwood - Red Ironbark - Black Cypress Woodland (Good) (PCT 405)
- 8a Derived Native Grassland (PCT 405)
- 9 White Bloodwood - Motherumbah - Red Ironbark Shrubby Woodland (Good) (PCT 406)
- 9a White Bloodwood - Motherumbah - Red Ironbark Shrubby Woodland (Moderate) (PCT 406)
- 10 Dirty Gum Shrubby Woodland (Good) (PCT 408)

Grassy Woodlands

- 11 Poplar Box Grassy Woodland (Good) (PCT 244)
- 11a Derived Native Grassland (PCT 244)

Semi-arid Woodlands (Grassy Sub-formation)

- 12 Belah Woodland (Good) (PCT 55)
- 12a Derived Native Grassland (PCT 55)
- 13 Dirty Gum - White Cypress Woodland on Sand Monkeys (Good) (PCT 206)
- Exotic
- Dam

LEGEND

- State Forest
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Existing/Approved Indicative Surface Development Footprint
- Indicative Approved Surface Development (Impact Reduction Area)

Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6
- Vegetation Integrity Plots

Threatened Ecological Communities

- Poplar Box Grassy Woodland on Alluvial Plains

Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021); AMBS (2020a)

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NARRABRI STAGE 3 PROJECT

Vegetation Integrity Plots

Figure 5

The vegetation integrity (site condition) plots used in the BAM Calculator are shown on Figure 5 and the plot data is provided as Attachment A. The vegetation integrity (site condition) data for the habitat within the Impact Reduction Area is provided in Table 2. The vegetation integrity scores generated by the BAM Calculator are also provided in Table 2.

Table 2
Vegetation Integrity Score Detail

Vegetation Zone	PCT ID and Vegetation Community (AMBS, 2020a)		PCT Condition Class	Sensitivity to Gain^	Patch Size	Composition Condition Score*	Structure Condition Score*	Function Condition Score*	Vegetation Integrity Score*
1b	88	Derived Native Grassland	DNG	High	>100	47.9	29.1	3.5	17
5	399	Red Gum – Tea Tree Creek Woodland	Good	High	>100	91	44.7	79.8	68.7
5a	399	Red Gum – Tea Tree Creek Woodland	Mod.	High	>100	79.3	22	33	38.6
7	404	Red Ironbark – White Bloodwood +/- Burrows Wattle Shrubby Woodland	Good	High	>100	65.4	59.6	48.3	57.3
7a	404	Red Ironbark – White Bloodwood +/- Burrows Wattle Shrubby Woodland	Mod.	High	>100	70.4	10.3	48.7	32.8
8	405	White Bloodwood – Red Ironbark – Black Cypress Woodland	Good	High	>100	77.1	27.3	65.6	51.7
8a	405	Derived Native Grassland	DNG	High	>100	64.3	21.4	34.1	36.1

^ The sensitivity class is set for each PCT by DPIE (2021a).

* BAM Calculator.

2.3 ECOSYSTEM CREDIT SPECIES

Ecosystem credit species for assessment are identified in the BAM Calculator. A total of 35 ecosystem credit species are listed in Table 3 from the BAM Calculator for the Impact Reduction Area. Species shaded in Table 3 are species with records in the locality of the Impact Reduction Area.

Table 3
Ecosystem Species from the BAM Calculator

Scientific Name	Common Name	Conservation Status		Biodiversity Credit Class[3]	Sensitivity to Potential Gain (DPIE, 2021b)
		BC Act[1]	EPBC Act[2]		
Birds					
Falco subniger	Black Falcon	V	-	Ecosystem	Moderate
Lophoictinia isura	Square-tailed Kite	V	-	Species/Ecosystem	Moderate
Hamirostra melanosternon	Black-breasted Buzzard	V	-	Species/Ecosystem	Moderate
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Species/Ecosystem	High
Circus assimilis	Spotted Harrier	V	-	Ecosystem	Moderate
Hieraaetus morphnoides	Little Eagle	V	-	Species/Ecosystem	Moderate
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	Species/Ecosystem	High
Lophochroa leadbeateri	Major Mitchell's Cockatoo	V	-	Species/Ecosystem	High (breeding) Moderate (foraging)

Table 3 (Continued)
Ecosystem Species from the BAM Calculator

Scientific Name	Common Name	Conservation Status		Biodiversity Credit Class[3]	Sensitivity to Potential Gain (DPIE, 2021b)
		BC Act[1]	EPBC Act[2]		
Glossopsitta pusilla	Little Lorikeet	V	-	Ecosystem	High
Neophema pulchella	Turquoise Parrot	V	-	Ecosystem	High
Lathamus discolor	Swift Parrot	E	CE	Species/Ecosystem	Moderate
Polytelis swainsonii	Superb Parrot	V	V	Species/Ecosystem	High (breeding) Moderate (foraging)
Tyto novaehollandiae	Masked Owl	V	-	Species/Ecosystem	High
Ninox connivens	Barking Owl	V	-	Species/Ecosystem	High
Hirundapus caudacutus	White-throated Needletail	-	V	Ecosystem	High
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-	Ecosystem	High
Chthonicola sagittata	Speckled Warbler	V	-	Ecosystem	High
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subspecies)	V	-	Ecosystem	Moderate
Grantiella picta	Painted Honeyeater	V	V	Ecosystem	Moderate
Melanodryas cucullata cucullata	Hooded Robin (south-eastern form)	V	-	Ecosystem	Moderate
Petroica boodang	Scarlet Robin	V	-	Ecosystem	Moderate
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	-	Ecosystem	Moderate
Daphoenositta chrysoptera	Varied Sittella	V	-	Ecosystem	Moderate
Pachycephala inornata	Gilbert's Whistler	V	-	Ecosystem	Moderate
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Ecosystem	Moderate
Stagonopleura guttata	Diamond Firetail	V	-	Ecosystem	Moderate
Mammals					
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Ecosystem	High
Phascolarctos cinereus	Koala	V	V	Species/Ecosystem	High
Macropus dorsalis	Black-striped Wallaby	E	-	Ecosystem	High
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Species/Ecosystem	High
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	Ecosystem	High
Miniopterus orianae oceanensis	Large Bent-winged Bat	V	-	Species/Ecosystem	Very High (breeding) High (foraging)
Nyctophilus corbeni	Corben's Long-eared Bat	V	V	Ecosystem	High
Chalinolobus picatus	Little Pied Bat	V	-	Ecosystem	High
Pseudomys pilligaensis	Pilliga Mouse	V	V	Ecosystem	High

Note: Highlighted species are species recorded in the locality of the Impact Reduction Area.

[1] Conservation status under the BC Act (current as at August 2021). E = Endangered; V = Vulnerable.

[2] Conservation status under the EPBC Act (current as at August 2021). CE = Critically Endangered; E = Endangered; V = Vulnerable.

[3] Biodiversity credit class under the *BioNet Threatened Biodiversity Data Collection* (DPIE, 2021b) (current as at August 2021).

2.4 SPECIES CREDIT SPECIES

Species credit species relevant to the Impact Reduction Area were identified. Species Polygons were created by AMBS (2020a and 2020b) for *Tylophora linearis*, Pale-headed Snake, Glossy Black-Cockatoo, Koala, Eastern Pygmy-possum and Squirrel Glider (Figures 6 to 11). Table 4 presents the area of habitat within the Impact Reduction Area and the corresponding credits. The credit report from the BAM Calculator for the Impact Reduction Area is provided as Attachment B.

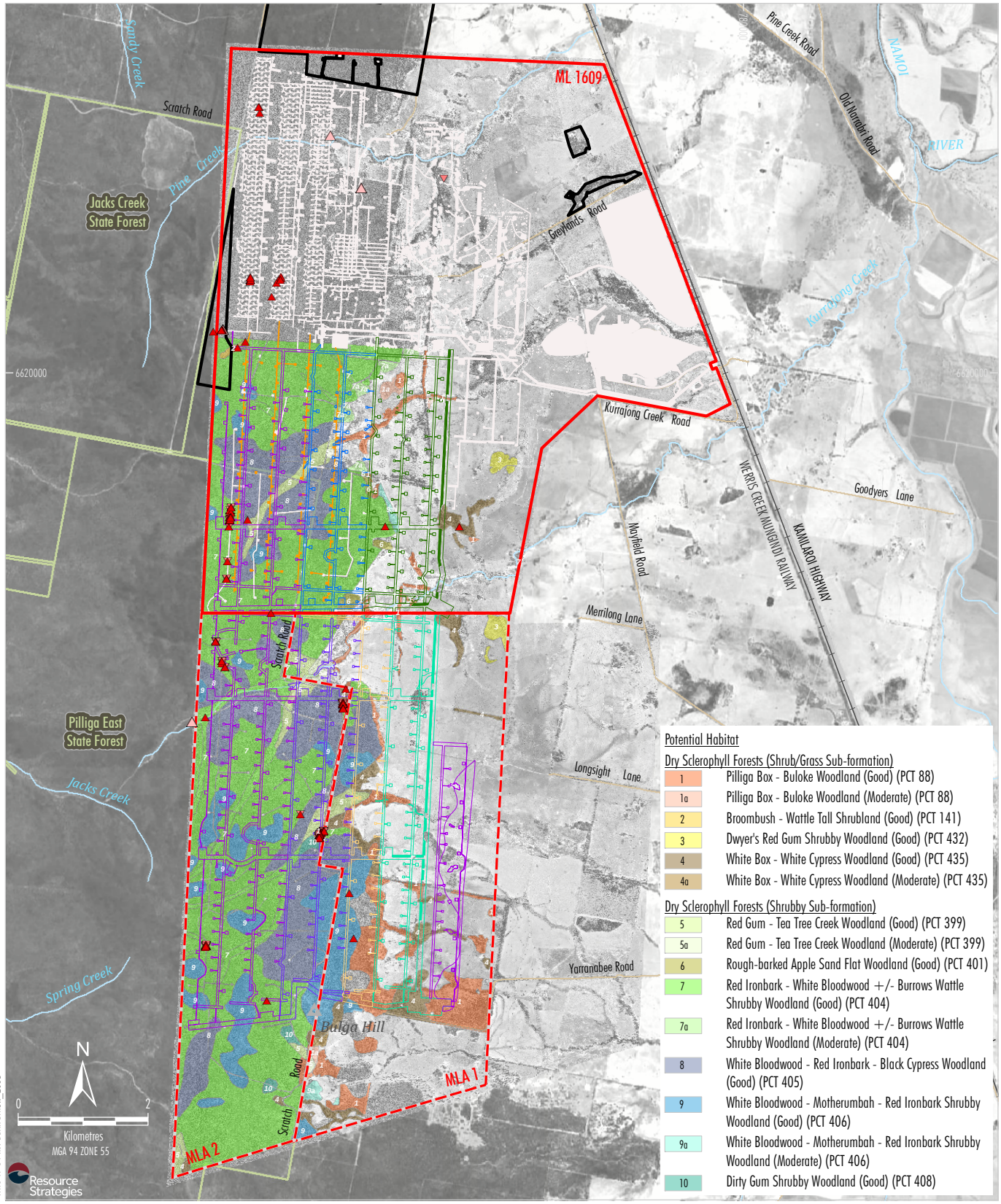
Table 4
Species Credits

Scientific Name	Common Name	Conservation Status		Area (ha)	Credits (Attachment B)
		BC Act[1]	EPBC Act[2]		
Tylophora linearis	-	V	E	13.9	387
Hoplocephalus bitorquatus	Pale-headed Snake	V	-	13.9	387
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	13.9	387
Phascolarctos cinereus	Koala	V	V	13.9	387
Cercartetus nanus	Eastern Pygmy-possum	V	-	13.9	387
Petaurus norfolcensis	Squirrel Glider	V	-	4.5	121

[1] Conservation status under the BC Act (current as at August 2021). V = Vulnerable.

[2] Conservation status under the EPBC Act (current as at August 2021). E = Endangered; V = Vulnerable.

Bertya opponens (Coolabah Bertya) is conservatively not included in Table 4 as the actual numbers of individuals that would be avoided is not known.



Potential Habitat

Dry Sclerophyll Forests (Shrub/Grass Sub-formation)

1	Pilliga Box - Buloke Woodland (Good) (PCT 88)
1a	Pilliga Box - Buloke Woodland (Moderate) (PCT 88)
2	Broombush - Wattle Tall Shrubland (Good) (PCT 141)
3	Dwyer's Red Gum Shrubby Woodland (Good) (PCT 432)
4	White Box - White Cypress Woodland (Good) (PCT 435)
4a	White Box - White Cypress Woodland (Moderate) (PCT 435)

Dry Sclerophyll Forests (Shrubby Sub-formation)

5	Red Gum - Tea Tree Creek Woodland (Good) (PCT 399)
5a	Red Gum - Tea Tree Creek Woodland (Moderate) (PCT 399)
6	Rough-barked Apple Sand Flat Woodland (Good) (PCT 401)
7	Red Ironbark - White Bloodwood +/- Burrows Wattle Shrubby Woodland (Good) (PCT 404)
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8	White Bloodwood - Red Ironbark - Black Cypress Woodland (Good) (PCT 405)
9	White Bloodwood - Motherumbah - Red Ironbark Shrubby Woodland (Good) (PCT 406)
9a	White Bloodwood - Motherumbah - Red Ironbark Shrubby Woodland (Moderate) (PCT 406)
10	Dirty Gum Shrubby Woodland (Good) (PCT 408)

LEGEND

- State Forest
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Existing/Approved Indicative Surface Development Footprint
- Narrabri Mine Existing Offset Area
- Indicative Approved Surface Development (Impact Reduction Area)

Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

Threatened Flora

Survey Monitoring Database

▲ ▼ △ Tylophora linearis

Sources:
Survey - AMBS (2019a); AMBS (2020a); ELA (2016a); ELA (2019a)
Monitoring - ELA Monitoring Data (2012 to 2018)
Database - ALA (2019); DPIE (2021)

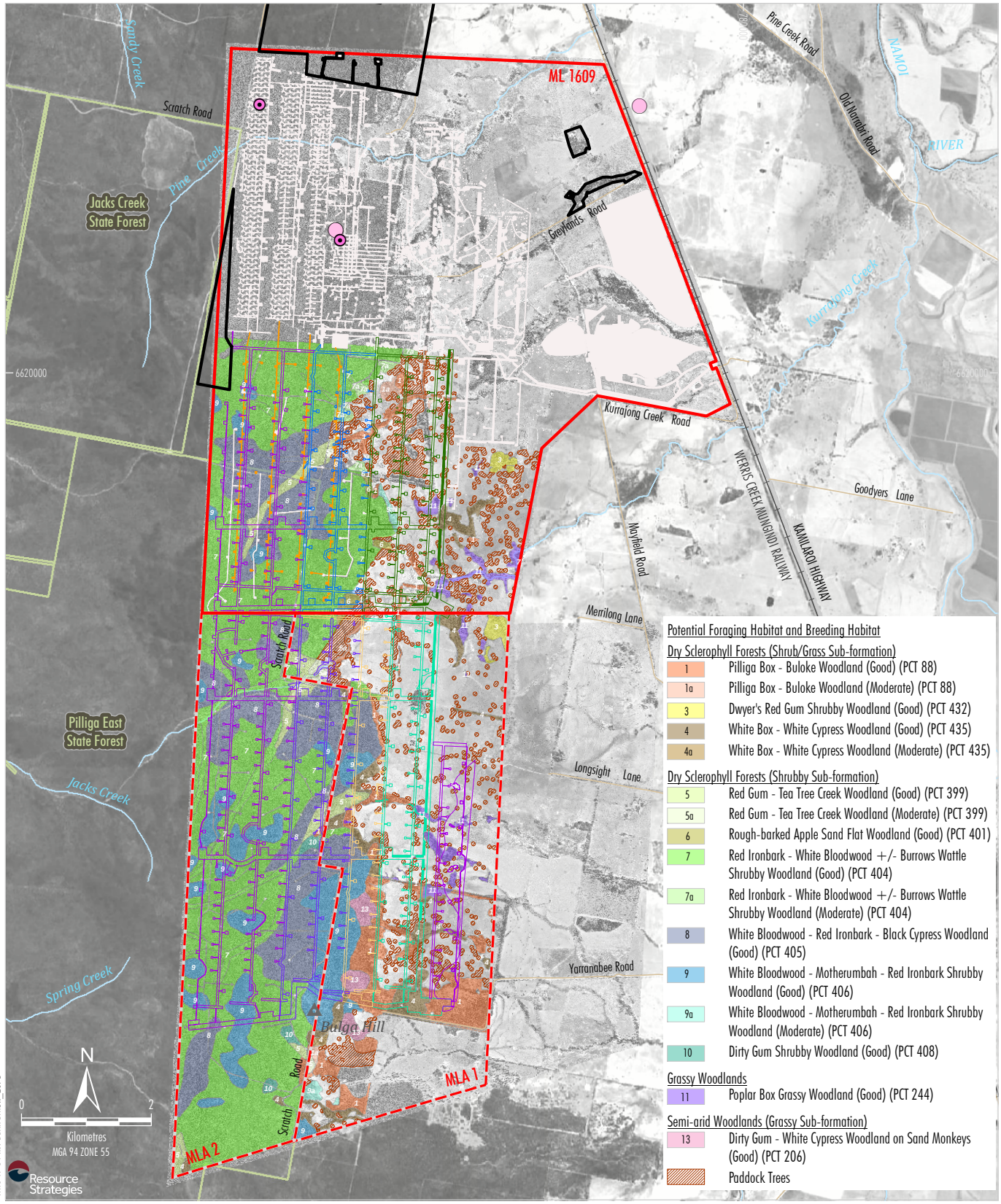
Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021); AMBS (2020a)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

***Tylophora linearis* Habitat (Species Polygon)**

Figure 6



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- State Forest
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Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

Threatened Fauna

Survey Monitoring Database

- Pale-headed Snake

Sources:
Survey - AMBS (2019b); Ecotone (2009)
Database - ALA (2019); DPIE (2019)

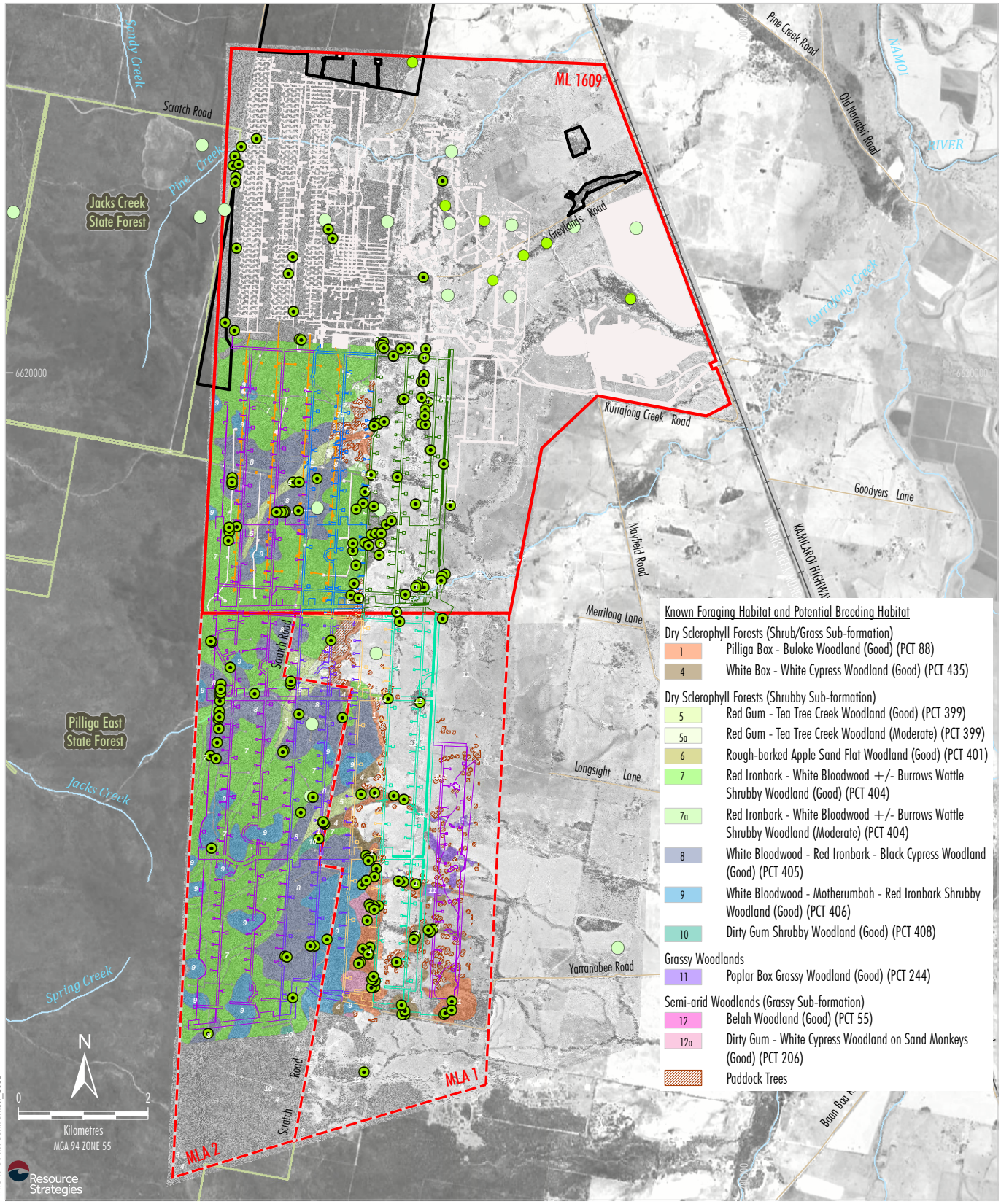
Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021); AMBS (2020a)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Pale-headed Snake Habitat (Species Polygon)

Figure 7



LEGEND

- State Forest
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Existing/Approved Indicative Surface Development Footprint
- Narrabri Mine Existing Offset Area
- Indicative Approved Surface Development (Impact Reduction Area)

Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

Threatened Fauna

Survey Monitoring Database

- Glossy Black-Cockatoo

Sources:
Survey - AMBS (2019b); AMBS (2020b); AMBS (2021); Ecotone (2009); ELA (2016a); ELA (2019b)
Database - ALA (2019); BirdLife Australia (2019); DPIE (2021)

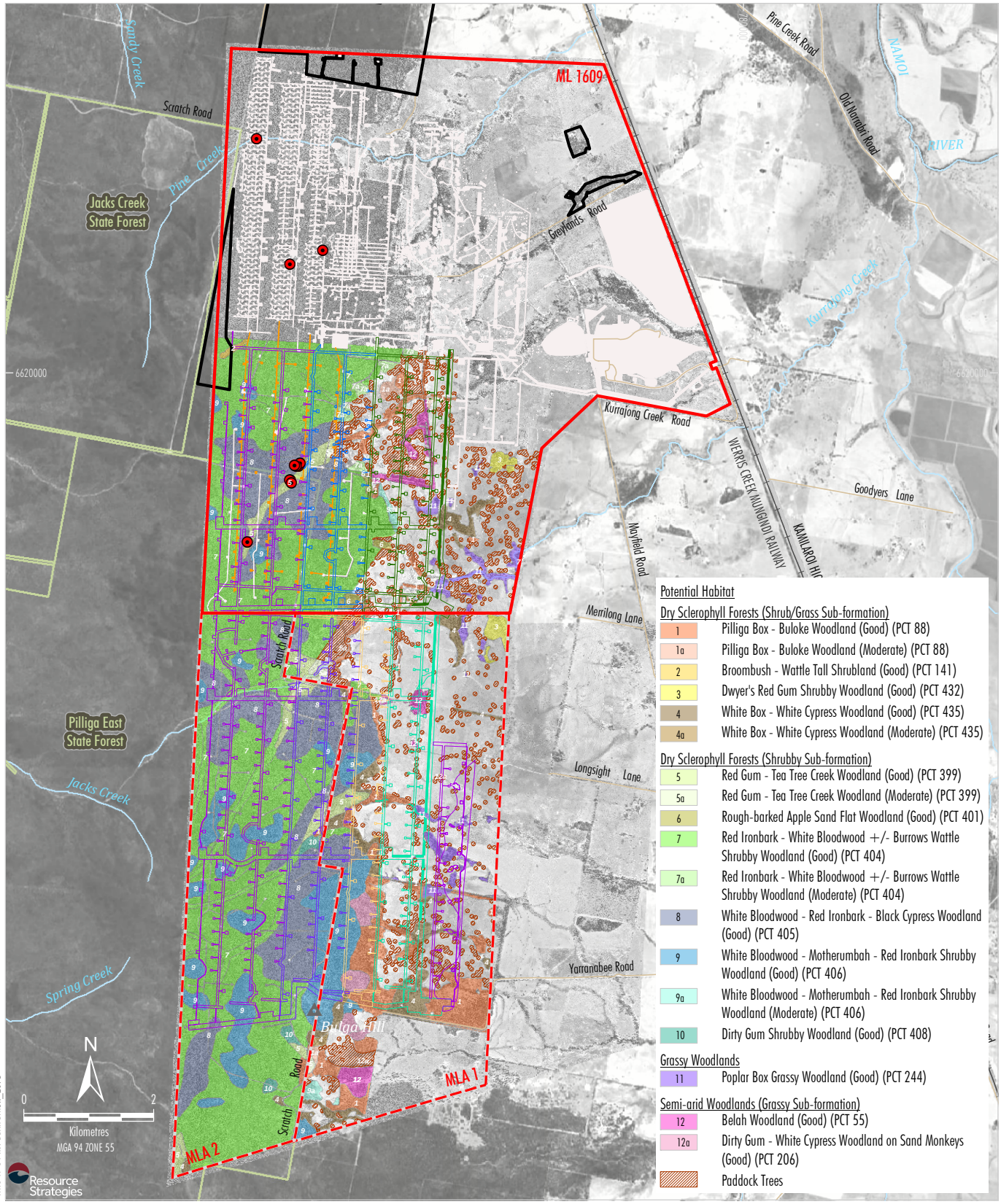
Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021); AMBS (2020a)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Glossy Black-Cockatoo Habitat (Species Polygon)

Figure 8



LEGEND

- State Forest
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Existing/Approved Indicative Surface Development Footprint
- Narrabri Mine Existing Offset Area
- Indicative Approved Surface Development (Impact Reduction Area)

Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

Threatened Fauna

Survey Monitoring Database

Koala

Sources:
Survey - AMBS (2019b); AMBS (2020b); Ecotone (2009)

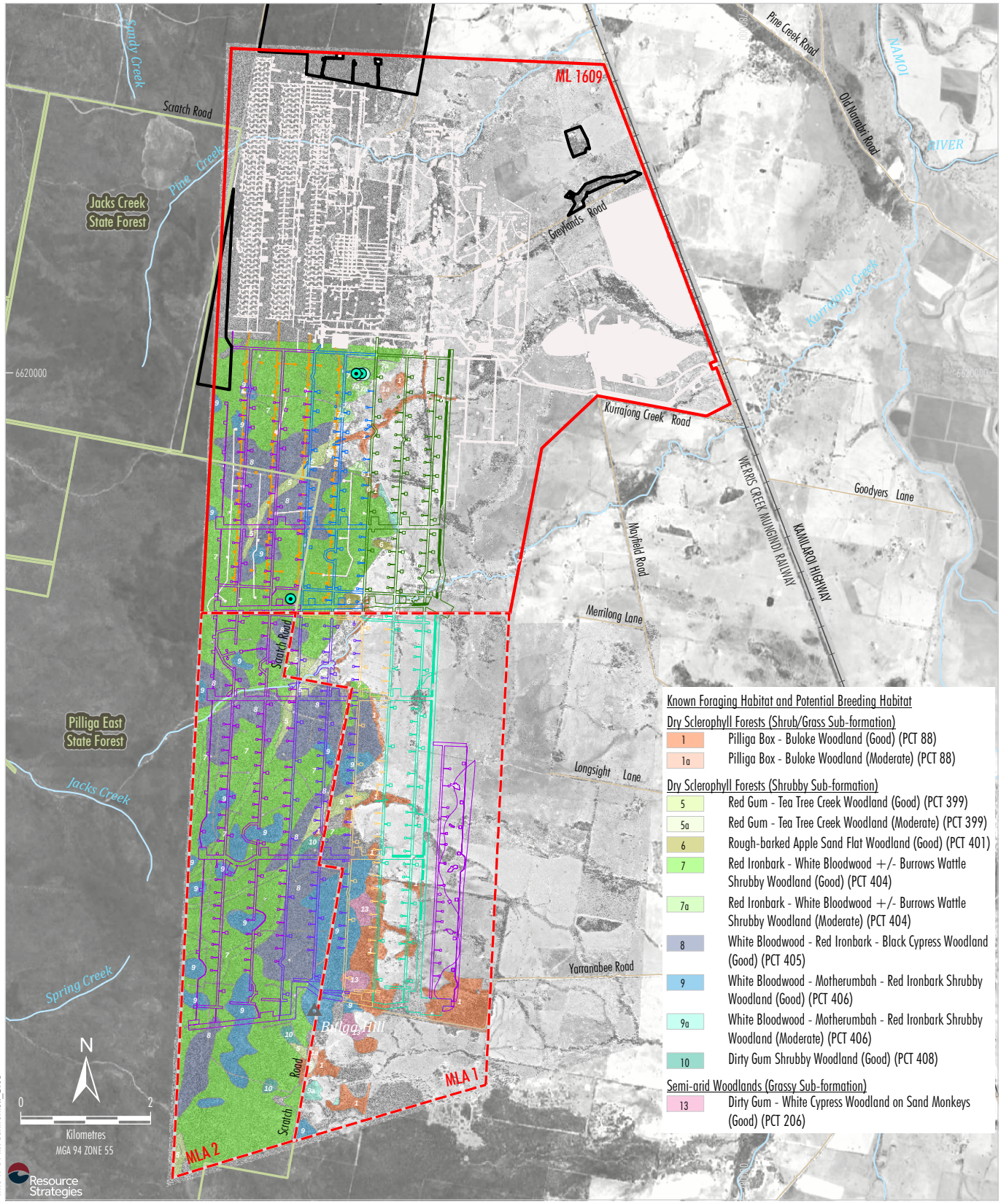
Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021); AMBS (2020a)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Koala Habitat (Species Polygon)

Figure 9



LEGEND

- State Forest
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Existing/Approved Indicative Surface Development Footprint
- Narrabri Mine Existing Offset Area
- Indicative Approved Surface Development (Impact Reduction Area)

Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

Threatened Fauna

Survey Monitoring Database

- Eastern Pygmy-possum

Sources:
Survey - AMBS (2020b); Ecotone (2009)
Database - ALA (2019); DPIE (2019)

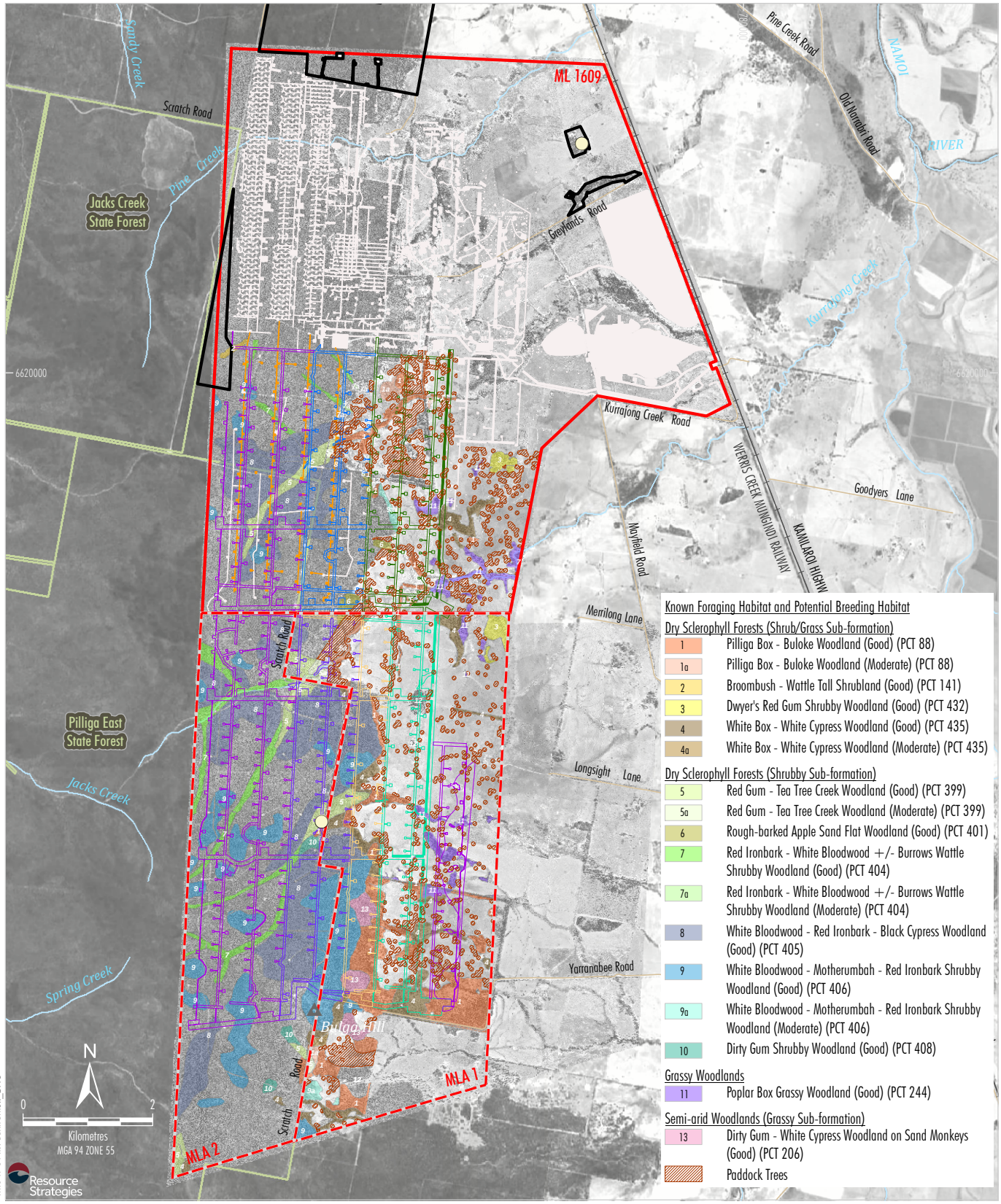
Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021); AMBS (2020a)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Eastern Pygmy-possum Habitat (Species Polygon)

Figure 10



Known Foraging Habitat and Potential Breeding Habitat

Dry Sclerophyll Forests (Shrub/Grass Sub-formation)

- 1 Pilliga Box - Buloke Woodland (Good) (PCT 88)
- 1a Pilliga Box - Buloke Woodland (Moderate) (PCT 88)
- 2 Broombush - Wattle Tall Shrubland (Good) (PCT 141)
- 3 Dwyer's Red Gum Shrubby Woodland (Good) (PCT 432)
- 4 White Box - White Cypress Woodland (Good) (PCT 435)
- 4a White Box - White Cypress Woodland (Moderate) (PCT 435)

Dry Sclerophyll Forests (Shrubby Sub-formation)

- 5 Red Gum - Tea Tree Creek Woodland (Good) (PCT 399)
- 5a Red Gum - Tea Tree Creek Woodland (Moderate) (PCT 399)
- 6 Rough-barked Apple Sand Flat Woodland (Good) (PCT 401)
- 7 Red Ironbark - White Bloodwood +/- Burrows Wattle Shrubby Woodland (Good) (PCT 404)
- 7a Red Ironbark - White Bloodwood +/- Burrows Wattle Shrubby Woodland (Moderate) (PCT 404)
- 8 White Bloodwood - Red Ironbark - Black Cypress Woodland (Good) (PCT 405)
- 9 White Bloodwood - Motherumbah - Red Ironbark Shrubby Woodland (Good) (PCT 406)
- 9a White Bloodwood - Motherumbah - Red Ironbark Shrubby Woodland (Moderate) (PCT 406)
- 10 Dirty Gum Shrubby Woodland (Good) (PCT 408)

Grassy Woodlands

- 11 Poplar Box Grassy Woodland (Good) (PCT 244)

Semi-arid Woodlands (Grassy Sub-formation)

- 13 Dirty Gum - White Cypress Woodland on Sand Monkeys (Good) (PCT 206)
- Paddock Trees

LEGEND

- State Forest
- Mining Lease (ML 1609)
- Provisional Mining Lease Application Area
- Existing/Approved Indicative Surface Development Footprint
- Narrabri Mine Existing Offset Area
- Indicative Approved Surface Development (Impact Reduction Area)

Development Footprint

- Phase 1
- Phase 2
- Phase 3
- Phase 4
- Phase 5
- Phase 6

Threatened Fauna

Survey Monitoring Database

- Squirrel Glider

Sources:
Database - ALA (2019); DPIE (2019)

Source: Orthophotos - NCOPL (2017); NCOPL (2019); NSW Spatial Services (2019); AMBS (2020a)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Squirrel Glider Habitat (Species Polygon)

Figure 11

2.5 IMPACT REDUCTION CREDIT SUMMARY

The ecosystem and species credits and areas associated with the Project and the Impact Reduction Area are provided in Tables 5 and 6. The credit report from the BAM Calculator for the Impact Reduction Area is provided as Attachment B.

Table 5
Impact Reduction Credit Summary – Ecosystem Credits

Veg Zone	Vegetation Community (AMBS, 2020a)	PCT ID	Project Development Footprint*		Impact Reduction Area	
			Total Disturbance by the Project (ha)	Total Credits	Area (ha) (Table 1)	Credits (Attachment B)
1	Pilliga Box –Buloke Woodland (Good)	88	49.2	1,118	0	-
1a	Pilliga Box – Buloke Woodland (Moderate)	88	0.2	3	0	-
1b	Derived Native Grassland	88	70.5	817	0.1	1
2	Broombush – Wattle Tall Shrubland (Good)	141	0.5	8	0	-
3	Dwyer's Red Gum Shrubby Woodland (Good)	432	0	0	0	-
4	White Box Woodland (Good)	435	28.2	513	0	-
4a	White Box Woodland (Moderate)	435	0	0	0	-
4b	Derived Native Grassland	435	22.6	45	0	-
5	Red Gum – Tea Tree Creek Woodland (Good)	399	11.9	319	0.5	13
5a	Red Gum – Tea Tree Creek Woodland (Moderate)	399	0.9	13	0.1	1
6	Rough-barked Apple Sand Flat Woodland (Good)	401	4.3	111	0	-
7	Red Ironbark – White Bloodwood Shrubby Woodland (Good)	404	192.5	5,193	9.5	204
7a	Red Ironbark – White Bloodwood Shrubby Woodland (Moderate)	404	2	29	0.2	2
8	White Bloodwood – Red Ironbark – Black Cypress Woodland (Good)	405	95.8	2,116	3.6	70
8a	Derived Native Grassland	405	0.7	9	0.1	1
9	White Bloodwood – Motherumbah – Red Ironbark Shrubby Woodland (Good)	406	35.5	834	0	-
9a	White Bloodwood – Motherumbah – Red Ironbark Shrubby Woodland (Moderate)	406	0.9	18	0	-
10	Dirty Gum Shrubby Woodland (Good)	408	0.1	3	0	-
11	Poplar Box Grassy Woodland	244	18.5	364	0	-
11a	Derived Native Grassland	244	24.2	79	0	-
12	Belah Woodland	55	7.6	239	0	-
12a	Derived Native Grassland	55	49	568	0	-
13	Dirty Gum – White Cypress Woodland on Sand Monkeys (Good)	206	1.6	48	0	-
		Total	**546.7**	**12,447**	**14.1**	**292**

Note: Highlighted cells are credits.

* Refer to Project Biodiversity Development Assessment Report (BDAR).

Table 6
Impact Reduction Credit Summary – Species Credits

Scientific Name	Common Name	Conservation Status		Development Footprint*		Impact Reduction Area	
		BC Act[1]	EPBC Act[2]	Total Disturbance by the Project (ha)	Total Credits	Area (ha)	Credits (Attachment B)
Tylophora linearis	-	V	E	422	13,607	13.9	387
Hoplocephalus bitorquatus	Pale-headed Snake	V	-	475.2	14,452	13.9	387
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	418.5	13,322	13.9	387
Phascolarctos cinereus	Koala	V	V	490.2	14,796	13.9	387
Cercartetus nanus	Eastern Pygmy-possum	V	-	390.8	12,950	13.9	387
Petaurus norfolcensis	Squirrel Glider	V	-	295.8	8,050	4.5	121

Note: Highlighted cells are credits.

* Refer to Project BDAR.

[1] Conservation status under the BC Act (current as at August 2021). V = Vulnerable.

[2] Conservation status under the EPBC Act (current as at August 2021). E = Endangered; V = Vulnerable.

3 EXISTING BIODIVERSITY OFFSET AREAS

Existing offset areas for the Narrabri Mine include the on-site offset areas (Figure 12), future on-site offset area (Figure 12) and the Kenna Property, located 30 km east (Figure 1) (Table 7). The offset areas have been subject to management since 2014. Management activities undertaken in the offset areas include, weed control via spraying, feral animal management via baiting and trapping, and firebreak maintenance.

The on-site offset areas have been secured (since 7 June 2021), under various Conservation Agreements under Part 4 Division 12 of the *National Parks and Wildlife Act 1974*. The following offset areas have been secured under conservation agreements: the offset area within the Greylands Road property under VC0049 and VC00528; the offset area within the Kurrajong Park property under VC0053; the offset area within the West Haven property under VC00531; the offset area within the Omeo property under VC00495; and the offset area within the Rosevale property under VC00529. The Kenna offset area has also been secured under a Conservation Agreement (VCA0468) since 27 June 2019.

The future on-site offset area would be included in the Project rehabilitation strategy as shown on Figure 12 in accordance with the Biodiversity Offset Strategy (ELA, 2019).

Table 7
Biodiversity Offsets for the Existing/Approved Narrabri Mine

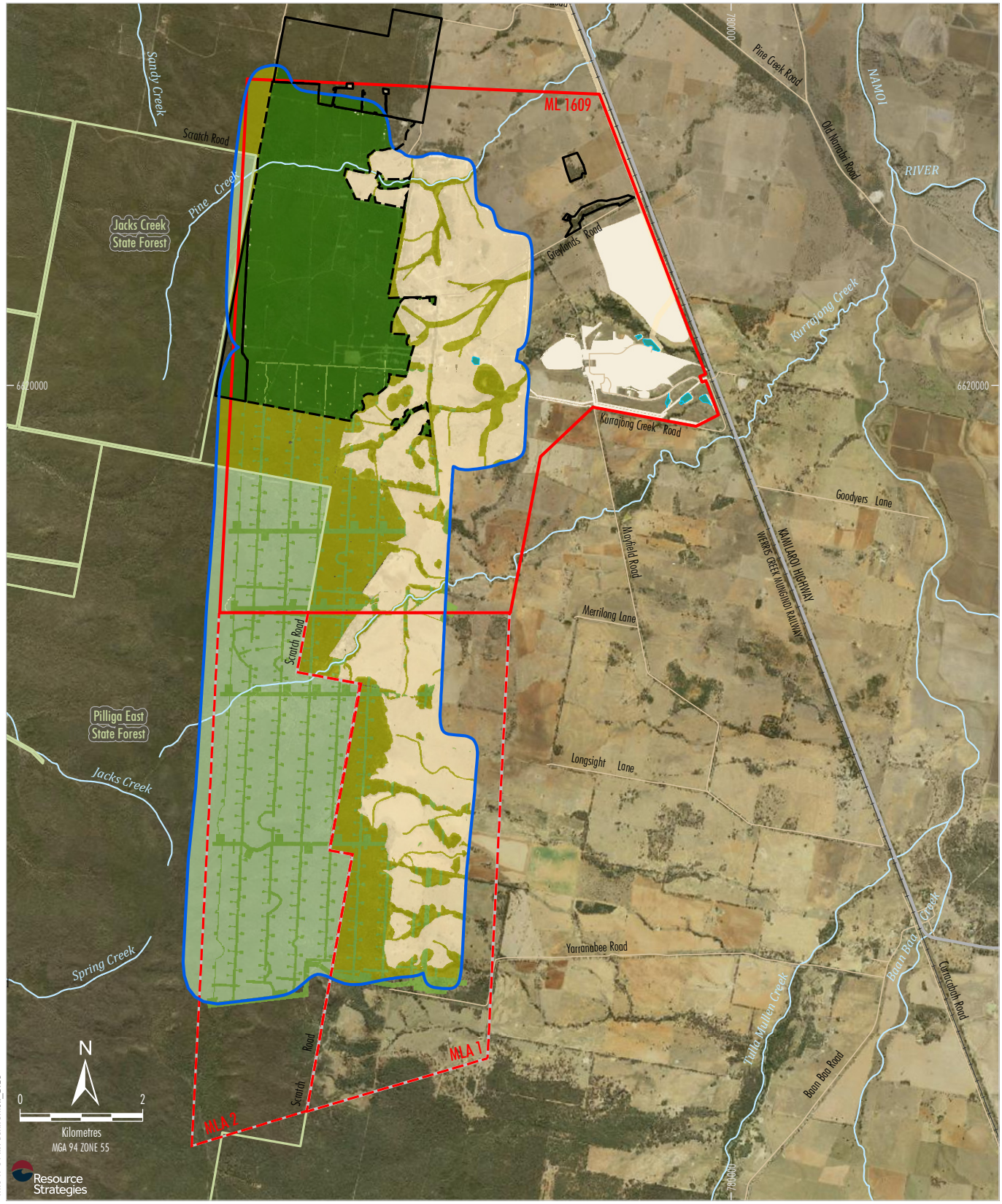
Biodiversity Offset Area	Description
On-site offset	▪ 422 ha ▪ Located partly within and partly adjacent to the Mine Site Boundary ▪ Contains woodland vegetation and threatened fauna habitat which will not be directly or indirectly affected by the project
Kenna Property	▪ 1,243 ha off-site offset ▪ Located approximately 30 km east of the Mine Site Boundary, directly adjacent to Mount Kaputar National Park
Future on-site offset	▪ 1,168 ha of woodland vegetation that will be subject to subsidence impacts at the mine site ▪ To be allocated at the end of mine life as a future onsite offset

Table 8 below is reproduced from Table 1 of the *Narrabri Coal Mine Stage 1 and 2 Biodiversity Offset Strategy* (ELA, 2019) and shows the ecological communities and habitat for threatened species across the offset areas.

Table 8
Vegetation in Existing Offset Areas for the Narrabri Mine

Vegetation Types	Offset Location	Good	Moderate	Derived Native Grassland	Subject to subsidence	Total area
Red Ironbark - Brown Bloodwood shrubby woodland of the Brigalow Belt South Bioregion	On-site	112.83	266.73	-	1,070.28	**1,449.84**
Pilliga Box - Poplar Box- White Cypress Pine grassy open woodland on alluvial loams	On-site	-	17.09	-	-	**17.09**
White Cypress Pine - Narrow-leaved Ironbark shrub/grass open forest of the western Nandewar Bioregion	Kenna	551.77	95.99	33.02	-	**680.78**
Inland Grey Box tall grassy woodland on clay soils in the Brigalow Belt South and Nandewar bioregions	On-site	-	10	-	89.49	**99.49**
Rough-barked Apple riparian forb/grass open forest of the Nandewar Bioregion (White Box - Yellow Box - Blakely's Red Gum EEC)	On-site	-	5.91	-	8.63	**14.54**
White Box grassy woodland of the Nandewar and Brigalow Belt South Bioregions	Kenna	13.80	34.87	428.23	-	**476.90**
River Oak Riparian woodland of the Brigalow Belt South and Nandewar Bioregions	On-site	-	10	-	-	**10**
River Red Gum riverine woodlands and forests in the Nandewar and Brigalow Belt South Bioregions	Kenna	-	35.07	-	-	**35.07**
White Cypress Pine - Silver-leaved Ironbark - Tumbledown Red Gum shrubby open forest of the Nandewar and Brigalow Belt South Bioregions	Kenna	10.49	-	-	-	**10.49**
Heathy shrublands on rocky outcrops of the western slopes	Kenna	18.07	-	-	-	**18.07**
Cleared land	Kenna	-	-	-	-	**20.52**
	TOTAL	**706.96**	**475.66**	**461.25**	**1,168.40**	**2,832.79**

Source: ELA (2019)



LEGEND

Mining Lease (ML 1609)
Provisional Mining Lease Application Area
Remediated Underground Mining Area

Secondary Domains

Water Management (A)
Pasture (B)
Woodland (C)
State Forest (D)
Mine Site Ecological Rehabilitation (E)
Biodiversity Offset (F)

Land Use

State Forest
Approved Biodiversity Offset Area
Future On-site Offset Area (2019)

Source: Orthophotos - NCOPL (2018); NSW Spatial Services (2019); NCOPL (2019); NCOPL (2021)

WHITEHAVEN COAL

NARRABRI STAGE 3 PROJECT

Conceptual Rehabilitation Domains and Proposed Final Land Use Concepts

Figure 12

4 CONCLUSION

The conditions of approval for the Project (if granted) would require NCOPL to retire biodiversity credits to offset the residual impact on biodiversity values (whether of the number and class specified in the Project BDAR or of another number and class) to the satisfaction of the NSW Secretary of the DPIE.

A key outcome from planning the design of the Project is that NCOPL proposes to forgo clearance of native vegetation within an area of approved surface disturbance that are not yet constructed or required for the Project. This area of approved surface disturbance has already been offset via existing offset areas.

Existing offset areas for the Narrabri Mine have been subject to management since 2014. Management activities undertaken in the offset areas include, weed control via spraying, feral animal management via baiting and trapping, and firebreak maintenance.

The on-site offset areas have been secured (since 7 June 2021), under various Conservation Agreements under Part 4 Division 12 of the *National Parks and Wildlife Act 1974*. The Kenna offset area has also been secured under a Conservation Agreement (VCA0468) since 27 June 2019. The future on-site offset area would be included in the Project rehabilitation strategy as shown on Figure 12 in accordance with the Biodiversity Offset Strategy (ELA, 2019).

As a result of running the Biodiversity Assessment Method Calculator, the Impact Reduction Area (if it were to be cleared) is equivalent to a total of 292 ecosystem credits and 2,056 species credits. NCOPL seeks from DPIE that these credits will be discounted from the credit liability for the Project.

5 REFERENCES

AMBS Ecology and Heritage (2020a) *Narrabri Underground Mine Stage 3 Extension Project – Flora Survey Report.* Prepared for Narrabri Coal Operations Pty Ltd.

AMBS Ecology and Heritage (2020b) *Narrabri Underground Mine Stage 3 Extension Project – Fauna Survey Report.* Prepared for Narrabri Coal Operations Pty Ltd.

Department of Planning, Industry and Environment (2020) *Biodiversity Assessment Method*. Published by the New South Wales Environment, Energy and Science Department of Planning, Industry and Environment, October 2020.

Department of Planning, Industry and Environment (2021a) *BioNet Vegetation Classification*. Website: http://www.environment.nsw.gov.au/NSWVCA20PRapp/LoginPR.aspx?ReturnUrl=%2fNSWVCA20PR ap%2fdefault.aspx.

Department of Planning, Industry and Environment (2021b) *BioNet Threatened Biodiversity Data Collection*. Website: http://www.environment.nsw.gov.au/AtlasApp/UI_Modules/TSM_/Default.aspx.

Eco Logical Australia (2019) *Narrabri Coal Mine Stage 1 and 2: Biodiversity Offset Strategy.* Prepared for Narrabri Coal Operations Pty Ltd. Revision 3, July 2019.

ATTACHMENT A

VEGETATION INTEGRITY (SITE CONDITION) DATA (AMBS, 2020a)

Table A1
Vegetation Integrity (Site Condition) Data

Plot Number	Plot ID	PCT	Condition Class	Zone	Easting	Northing	Bearing	Composition Tree	Composition Shrub	Composition Grass	Composition Forbs	Composition Ferns	Composition Other	Structure Tree	Structure Shrub	Structure Grass	Structure Forbs	Structure Ferns	Structure Other	Large Trees	Hollow Trees	Litter Cover	Length Fallen Logs	Tree Stem 5 to 9 cm	Tree Stem 10 to 19 cm	Tree Stem 20 to 29 cm	Tree Stem 30 to 49 cm	Tree Stem 50 to 79 cm	Tree Regeneration	High Threat Exotic
24	N3BP0069a	88	DNG	55	774266	6619723	140	0	0	5	10	1	0	0	0	47.6	1	0.1	0	0	0	18.6	0	0	0	0	0	0	0	0
54	N3BP0050a	399	Good	55	772997	6618321	186	2	10	8	8	1	2	15.5	43.4	3.6	5.7	0.1	0.2	0	5	54	20	1	1	1	1	0	1	0
55	N3BP0090	399	Good	55	773182	6618469	24	3	12	7	4	0	2	25.3	27.2	1.1	0.4	0	0.2	1	7	75	47	1	1	1	1	1	1	0
58	N3BP0091	399	Moderate	55	773575	6618772	91	3	8	4	5	1	2	7.1	15.8	6.6	0.5	0.5	0.2	0	0	19	0	1	1	1	1	0	1	0
82	N3BP0009a	404	Good	55	771929	6617214	140	4	4	1	3	1	1	43	49.1	0.1	0.3	0.1	0.1	0	0	64	13	1	1	1	0	0	1	0
83	N3BP0063a	404	Good	55	774043	6620306	88	3	3	4	9	1	0	11	0.4	12.3	0.9	0.2	0	0	0	34	13	1	1	0	1	0	1	0
84	N3BP0064a	404	Good	55	772191	6619726	242	5	10	5	3	1	1	40.1	26.2	0.7	0.3	0.1	0.1	0	3	65	27	1	1	1	1	0	1	0
85	N3BP0066a	404	Moderate	55	773771	6619348	327	6	4	12	5	1	2	17.4	0.9	7.1	1.4	0.1	0.2	0	0	34	26	1	1	1	1	0	1	0
86	N3BP0070a	404	Moderate	55	773890	6619435	250	3	2	5	6	1	1	12.1	2.1	3.4	0.6	0.1	0.1	0	0	54	15	1	1	1	1	0	1	0
90	N3BP0065a	405	DNG	55	773707	6619127	40	3	6	4	4	1	0	7.1	21.4	4.2	0.4	0.1	0	0	0	14	3	1	0	1	1	0	1	0
91	N3BP0092	405	DNG	55	773793	6619210	335	1	5	4	13	1	1	5	2.3	16.3	1.7	0.1	0.1	0	0	44.4	0	1	1	0	0	0	1	0
95	ELA0025	405	Good	55	772871	6615936	270	3	10	2	5	0	0	8	13	16	2	0	0	1	3	26	9	1	1	1	0	1	1	0
100	N3BP0003a	405	Good	55	773507	6617874	341	4	11	6	5	1	0	29	5.5	2.4	0.6	0.1	0	0	3	82	9	1	1	1	1	0	1	0

ATTACHMENT B

BAM BIODIVERSITY CREDIT REPORT – IMPACT REDUCTION AREA

BAM Biodiversity Credit Report (Like for like)

Proposal Details

Assessment Id 00020114/BAAS17080/20/00020115	Proposal Name Narrabri Underground Mine Stage 3 Extension Project Impact Reduction Area	BAM data last updated * 10/06/2021
Assessor Name	Assessor Number	BAM Data version * 45
Proponent Names	Report Created 17/09/2021	BAM Case Status Finalised
Assessment Revision 0	Assessment Type Major Projects	Date Finalised 17/09/2021

* Disclaimer: BAM data last updated may indicate either complete or partial update of the BAM calculator database. BAM calculator database may not be completely aligned with Bionet.

Potential Serious and Irreversible Impacts

Name of threatened ecological community	Listing status	Name of Plant Community Type/ID
Nil		

Species
Nil

Additional Information for Approval

PCTs With Customized Benchmarks

PCT
No Changes

Predicted Threatened Species Not On Site

Name
No Changes

Ecosystem Credit Summary (Number and class of biodiversity credits to be retired)

Name of Plant Community Type/ID	Name of threatened ecological community	Area of impact	HBT Cr	No HBT Cr	Total credits to be retired
88-Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion	Not a TEC	0.1	0	1	1
399-Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion	Not a TEC	0.6	13	1	14
404-Red Ironbark - White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests	Not a TEC	9.7	204	2	206
405-White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions	Not a TEC	3.7	70	1	71

88-Pilliga Box - White Cypress Pine - Buloke shrubby woodland in the Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Pilliga Outwash Dry Sclerophyll Forests This includes PCT's: 88, 141, 148, 397, 411, 702, 1090, 1384	Pilliga Outwash Dry Sclerophyll Forests <50%	88_DNG	No	1	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

399-Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion

Like-for-like credit retirement options

Class	Trading group	Zone	HBT	Credits	IBRA region
Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398,	Western Slopes Dry Sclerophyll Forests <50%	399_Good	Yes	13	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398, 1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771					
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324,	Western Slopes Dry Sclerophyll Forests <50%	399_Moderate	No	1	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or

	325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398, 1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771					Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

404-Red Ironbark - White Bloodwood +/- Burrows Wattle heathy woodland on sandy soil in the Pilliga forests	Like-for-like credit retirement options					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398,	Western Slopes Dry Sclerophyll Forests <50%	404_Good	Yes	204	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771					
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940,	Western Slopes Dry Sclerophyll Forests <50%	404_Moderate	No	2	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398, 1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771					

405-White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions	**Like-for-like credit retirement options**					
	Class	Trading group	Zone	HBT	Credits	IBRA region
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398, 399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420,	Western Slopes Dry Sclerophyll Forests <50%	405_DNG	No	1	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398, 1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771					
	Western Slopes Dry Sclerophyll Forests This includes PCT's: 54, 110, 179, 217, 243, 255, 270, 273, 287, 291, 309, 321, 322, 323, 324, 325, 327, 330, 331, 333, 341, 343, 346, 348, 354, 358, 379, 387, 396, 398,	Western Slopes Dry Sclerophyll Forests <50%	405_Good	Yes	70	Pilliga, Bogan-Macquarie, Castlereagh-Barwon, Inland Slopes, Kerrabee, Liverpool Plains, Liverpool Range, Pilliga Outwash and Talbragar Valley. or Any IBRA subregion that is within 100 kilometers of the outer edge of the impacted site.

	399, 401, 402, 403, 404, 405, 406, 407, 408, 409, 414, 415, 417, 419, 420, 423, 425, 430, 431, 440, 443, 449, 455, 456, 457, 459, 462, 463, 467, 468, 469, 470, 471, 472, 473, 476, 477, 478, 479, 480, 482, 515, 531, 532, 576, 577, 581, 592, 610, 617, 671, 673, 676, 712, 713, 714, 746, 863, 889, 940, 956, 1133, 1176, 1277, 1278, 1279, 1307, 1313, 1314, 1316, 1381, 1398, 1610, 1629, 1654, 1655, 1656, 1657, 1660, 1661, 1663, 1668, 1669, 1671, 1672, 1674, 1676, 1677, 1678, 1679, 1680, 1709, 1711, 1770, 1771					

Species Credit Summary

BAM Biodiversity Credit Report (Like for like)

Species	Vegetation Zone/s	Area / Count	Credits
Calyptorhynchus lathami / Glossy Black-Cockatoo	**399_Good, 399_Moderate, 404_Good, 404_Moderate, 405_Good**	13.9	387.00
Cercartetus nanus / Eastern Pygmy-possum	**399_Good, 399_Moderate, 404_Good, 404_Moderate, 405_Good**	13.9	387.00
Hoplocephalus bitorquatus / Pale-headed Snake	**399_Good, 399_Moderate, 404_Good, 404_Moderate, 405_Good**	13.9	387.00
Petaurus norfolcensis / Squirrel Glider	**399_Good, 399_Moderate, 404_Good, 405_Good**	4.5	121.00
Phascolarctos cinereus / Koala	**399_Good, 399_Moderate, 404_Good, 404_Moderate, 405_Good**	13.9	387.00
Tylophora linearis / Tylophora linearis	**399_Good, 399_Moderate, 404_Good, 404_Moderate, 405_Good**	13.9	387.00

Credit Retirement Options

Like-for-like credit retirement options

Calyptorhynchus lathami / Glossy Black-Cockatoo	Spp	IBRA subregion
	Calyptorhynchus lathami / Glossy Black-Cockatoo	Any in NSW

Cercartetus nanus / Eastern Pygmy-possum	Spp	IBRA subregion
	Cercartetus nanus / Eastern Pygmy-possum	Any in NSW
Hoplocephalus bitorquatus / Pale-headed Snake	Spp	IBRA subregion
	Hoplocephalus bitorquatus / Pale-headed Snake	Any in NSW
Petaurus norfolcensis / Squirrel Glider	Spp	IBRA subregion
	Petaurus norfolcensis / Squirrel Glider	Any in NSW
Phascolarctos cinereus / Koala	Spp	IBRA subregion
	Phascolarctos cinereus / Koala	Any in NSW
Tylophora linearis / Tylophora linearis	Spp	IBRA subregion
	Tylophora linearis / Tylophora linearis	Any in NSW