Carmichael Conservation and Research Program

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Version 6

Contents

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Abbreviations and definitions

Abbreviation	Description
Administering authority	The responsible entity for administering legislation as per the relevant Commonwealth or Queensland Government administrative arrangements order
BOS	*Biodiversity Offset Strategy, Carmichael Coal Mine and Rail Project, Adani Mining Pty Ltd (August 2016)*, approved October 2016
BTF	Black-throated Finch (southern) (*Poephila cincta cincta*)
CG	Coordinator-General
Department	Commonwealth Department of the Environment and Energy
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EPBC Approval	The approval granted to the Proponent by the Commonwealth under the EPBC Act, being controlled action approval EPBC 2010/5736 dated 14 October 2015
Fund	The Trust and established fund mechanisms to support the Carmichael Conservation and Research Program and other Programs
GDE	Groundwater dependent ecosystem
member	In relation to the Trust or Fund means the Proponent and any additional proponents that choose to sign up to the Trust or Fund
MNES	Matters of National Environmental Significance, as defined under the EPBC Act but for the purpose of this Program, only refers to those MNES that are listed as EPBC Act listed threatened species and communities under the EPBC Approval
Minister	The Minister responsible for administering the *Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth), or a delegate
Project	The Carmichael Coal Mine and Rail Infrastructure Project, as defined under the EPBC Approval
Proponent	Adani Mining Pty Ltd
RE	Regional Ecosystem
Research Grant Agreement	Agreement between the Trustee and a third party researcher/s on terms acceptable to the Steering Committee and the Trustee, including relating to the amount of funding granted by the Fund, the timing of the funding, and the obligations of the researcher for a particular Research Project
Research Project	A research project to be undertaken into threatened species and communities that is intended to achieve, in whole or in part, Program objects that has been approved by the Steering Committee to be funded (in whole or in party) by the Fund and to which a Research Grant Agreement has been entered into by the relevant researcher/s and the Trustee on behalf of the Fund
Trust	The unit trust established by the Proponent, being the Galilee Basin Conservation & Research Fund
Trustee	Galilee Biodiversity Company Pty Ltd

1 Introduction

This document is divided into the following parts:

- Section 1 – Introduction
- Section 2 – Carmichael Conservation and Research Program (the Program), that is applicable to the Carmichael Coal Mine and Rail Infrastructure Project (Project) as it relates to *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) controlled action approval EPBC 2010/5736 (EPBC Approval) for the Project, proposed by Adani Mining Pty Ltd (Proponent)
- Section 3 – Description of the Galilee Basin Conservation and Research Fund (Fund), designed to support the Program outlined in section 2, and provides the ability for other proponents in the Galilee Basin to use the Fund.

2 Carmichael Conservation and Research Program

2.1 Objective

This objective of this Program is to address conditions 15 to 19 of the (EPBC Approval for the Project, proposed by the Proponent. Appendix 1 includes a table describing how the conditions have been met.

The objectives are also as follows:

- the establishment and/or contribution to a pool of funds established for the better protection and long term conservation of the following EPBC Act listed threatened species and communities:
    - Black-throated Finch (southern) (*Poephila cincta cincta*) (BTF)
    - Brigalow (*Acacia harpophylla* dominant and co-dominant) threatened ecological community (TEC)
    - Ornamental snake (*Denisonia maculata*)
    - Squatter pigeon (southern) (*Geophaps scripta scripta*)
    - Waxy cabbage palm (*Livistona lanuginosa*)
    - Yakka skink (*Egernia rugosa*)
- to provide a mechanism to establish and/or contribute to a pool of funds, including terms of reference to support a regional approach, funding mechanisms and an initial work plan, for provision to the Minister the mechanism may be in the form of a trust fund, or other mechanism/s as agreed by the Minister in writing
- contribution of $100 000 (GST exclusive) per annum for 10 consecutive years to the pool of funds beginning from commencement of mining operations
- to provide notice of the establishment of and/or contribution to the pool of funds to the Department in writing prior to commencement of mining activities. Documentary evidence

must be provided to the Department showing that the annual financial contributions to the pool of funds have been provided within 30 calendar days of each payment

- to ensure funds facilitate the development and implementation of research programs consistent with priorities to manage development impacts on EPBC Act listed threatened species and communities listed in Table 1 of Appendix 2 which are consistent with, and take into consideration, any relevant recovery plans, threat abatement plans and/or conservation advices
- to ensure research programs identify measures to mitigate and manage the impacts on EPBC Act listed threatened species and communities listed in Table 1 of Appendix 2, which should address, where relevant:
    - methodologies for a baseline survey that will report on:
        - each species' life history
        - movement patterns
        - habitat requirements
        - population dynamics
    - survey methodologies, in accordance with the Department's survey guidelines or alternative best practice methodologies that are agreed to in writing by the Minister prior to commencement and endorsed by a suitably qualified independent expert
    - an ongoing monitoring program (developed from the baseline monitoring) for each species, to continue for the duration of the research programs, with annual reporting to the Department
    - commitments, including financial commitments and associated timeframes, that will be implemented by the Proponent to support the undertaking of research
    - the time frames for undertaking each research component
    - timing and methods of reporting research outcomes to the Minister, the scientific community and the public
    - outcomes of consultation with the Department on how the proposed Research Programs align with other studies for EPBC Act listed threatened species and communities listed in Table 1 of Appendix 2
    - identification of priority actions for funding, decided in consultation with the Queensland Department of Environment and Science and members of relevant Recovery Teams
- to review funding five years after the establishment of the pool of funds and/or the commencement of the action or as otherwise agreed by the Minister in writing. This review must:
    - take into account progress of the research programs and any subsequent on ground actions
    - take into account the involvement of other holders of approvals under the EPBC Act in funding and administrative arrangements
    - be provided to the Department within six months after the five year period.

2.2 Descriptions of Matters of National Environmental Significance

2.2.1 Black-throated Finch (southern)

The southern sub-species of the BTF lives in the Brigalow Belt North and Desert Uplands bioregions of Queensland, which cover 135,500 km^2 and include the towns of Townsville, Bowen, Emerald, Clermont and Collinsville (Buosi 2011). Based on mapping of all records of BTF up to 2010 and a comparison with post-2000 records, the distribution of BTF is estimated to have contracted by 50-80% of its historical range and is now rarely recorded south of Clermont (160 km south of the Project Area) (Buosi 2011).

BTF habitat typically consists of grassy eucalypt woodlands adjacent to water or riparian corridors (DEE 2018). Preferred habitat consists of patches with suitable grasses, low vegetation density or bare ground to allow access to the seed bank and an open tree layer that does not have a continuously dense shrubby understorey (Rechetelo *et al.* 2016). Mitchell (1996) noted that the southern subspecies requires a mosaic of different habitats during the wet season in which to find seed. This subspecies has also been recorded in degraded habitats, including cultivated areas near woodlands and heavily grazed paddocks (DEE 2018).

The species can be found in a range of woody plant communities with records known from at least 21 Regional Ecosystems (RE) (Vanderduys *et al.* 2016). Woodland vegetation typically consists of ironbark (e.g. *Eucalyptus melanophloia*, *E. crebra* and *E. drepanophylla*), bloodwood (*Corymbia dallachiana*, *C. erythrophloia* and *C. clarksoniana*) and gums (*E. platyphylla* and *E. brownii*). Records from other vegetation communities includes wetlands, riparian paperbark woodlands and native grasslands (Vanderduys *et al.* 2016). Approximately 78% of records within the Galilee Basin region are associated with Broad Vegetation Group (BVG) 17b which is described as 'woodlands to open woodlands dominated by *Eucalyptus melanophloia* (silver-leaved ironbark) or *E. shirleyi* (Shirley's silver-leaved ironbark) on sand plains and footslopes of hills and ranges' (Dreis unpublished).

In the Project Area, grassy open-woodland communities dominated by *Eucalyptus melanophloia* (RE 10.5.5a) are preferred, though the species is not restricted to this community (ELA 2016a, 2017; E2M 2017a). Other habitats where BTF have been recorded on multiple occasions include *Eucalyptus brownii* open-woodland (RE 10.3.6ax1), and less commonly in *Eucalyptus similis* and *Corymbia brachycarpa* open-woodland (RE 10.5.1a) and *Corymbia setosa* open-woodland (RE 10.5.1d) (ELA 2016a, 2017; E2M 2017a).

2.2.2 Brigalow Threatened Ecological Community

The Brigalow TEC extends from south of Charters Towers in Queensland, in a broad band east of Blackall, Charleville and Cunnamulla, south to northern New South Wales near Narrabri and Burke (DEE 2018). In Queensland, the TEC occurs predominately within the Brigalow Belt North and Brigalow Belt South bioregions, with smaller amounts in the Southeast Queensland and Mulga Lands bioregions (DEE 2018). In Queensland, about 85% of the TEC's remnants occur on flat to gently undulating Cainozoic clay plains that are not associated with current alluvium, and on gently undulating landscapes on more or less horizontally bedded fine grained sedimentary rocks. About 10% of remnants are associated with river and creek flats, and the remainder with old loamy and sandy plains, basalt plains and hills, or hills and lowlands on metamorphic or granitic rocks (DEE 2018). The soils are predominantly cracking clays where brigalow is dominant; however, where Eucalyptus species are co-dominant, texture contrast soils are common (DEE 2018).

The Brigalow TEC (RE 11.4.9) is known to occur predominately in the south of the Project Area. Specifically, the Brigalow TEC located south of the Carmichael River occurs along the eastern boundary, at the junction of EPC1080 and EPC1690, generally within contiguous remnant vegetation with low levels of fragmentation and high levels of community integrity (GHD 2012). The sections of Brigalow TEC north of the Carmichael River are present in small, highly fragmented portions within

which the community structure and species composition is generally highly modified from its natural state (GHD 2012).

2.2.3 Ornamental snake

The ornamental snake is only known from the Brigalow Belt North, and parts of the Brigalow Belt South Bioregions (DEE 2018). The stronghold of this species is within the Fitzroy and Dawson River catchments, particularly in the area surrounding Moranbah (DEE 2018).

Ornamental snake inhabit low-lying areas with cracking clay soils, where it can be locally abundant (Wilson & Swan 2011). However, populations are sparsely distributed across this species' range (DEE 2018). The Ornamental Snake prefers moist areas and adjoining elevated ground, particularly areas associated with gilgai development (DEE 2018). Gilgais support an abundance of frogs, which are their preferred, almost exclusive, prey (DEE 2018). Areas dominated by brigalow (*Acacia harpophylla*), gidgee (*Acacia cambagei*), blackwood (*Acacia argyrodendron*), and coolabah (*Eucalyptus coolabah*) are the habitats where the ornamental snake is most likely to be found (DEE 2018), which includes riverside woodlands and open forest on levees (Cogger 1993). Ornamental snakes are known to also occur in disturbed habitat structures, including cleared paddocks and woody regrowth, where both shelter and frog prey are available (Curtis 2010).

The Project Area is on the western edge of the area modelled as known/likely to support ornamental snake populations (DSEWPaC 2011), with records in the greater region (DES 2018). It is considered likely that this species occurs in the Project Area, based on its known and modelled distribution, the presence of suitable habitat, and the fact that it has been previously recorded within approximately 90 km of the Project Area (GHD 2012). The ornamental snake is yet to be detected in the Project Area. Diurnal and nocturnal surveys during spring and autumn 2011 did not detect this species in the Project Area; however, it is not clear if the surveys targeted post-rainfall events when the ornamental snake is most active. There are no known survey methods for detecting ornamental snakes during dry or cool weather, when they are inactive and probably sheltering beneath the ground in soil cracks rather than under accessible surface debris (DSEWPaC 2011).

2.2.4 Squatter pigeon (southern)

Squatter pigeons are known to occur north of the Burdekin River, east to Townsville and Proserpine and south to the Queensland-New South Wales Border and west as far as Longreach. Where squatter pigeon occurs it can be locally abundant (Curtis 2010).

The estimated extent of occurrence is approximately 440,000 km^2 (DEE 2018). The estimated total population of the species is considered to be of low reliability as no systematic surveys have been undertaken. However, in 2000 the population was estimated at 40,000 breeding birds (Garnett, Szabo & Dutson 2011). Given the species ubiquitous nature and relative abundance, the population is thought to be stable at present. It is also thought this species occurs as a single, contiguous (i.e. inter-breeding) population (DEE 2018).

The squatter pigeon forages in any remnant or regrowth open-forest to sparse, open-woodland or scrub dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species, on sandy or gravelly soils, within 3 km of a suitable, permanent or seasonal water body (Squatter Pigeon Workshop 2011). Although it is most common in grassy woodlands and open forests dominated by eucalypts, it has no close associations with any particular vegetation type (DEE 2018). Non-remnant and regrowth areas are also used by this species, in areas within 3 km of suitable water (DEE 2018). Squatter pigeons are commonly recorded in areas of disturbed habitat including grazed grasslands, scrub, and areas adjacent to roads and railway lines (DEE 2018).

The squatter pigeon in known to occur in the surrounding region (DES 2018) and across the mine component of the Project Area (GHD 2012; E2M 2017b). Within the Project Area, the species is most frequently sighted incidentally and during standardised bird surveys, on tracks through regrowth and remnant open woodland dominated by silver-leaved ironbark (*Eucalyptus melanophloia*) (Regional Ecosystem 10.5.5a and RE 10.2.38). Within the mine footprint, the squatter pigeon has also been sighted in open woodland dominated by brown's box (*Eucalyptus brownii*) (RE 10.3.6ax1), mixed eucalypts (RE10.5.1a), gidgee (*Acacia cambagei*) and brigalow (*Acacia harpophylla*) (RE10.4.5), and riparian woodland dominated by red river gum (*Eucalyptus camaldulensis*) (RE10.3.13a). Sightings ranged from single birds to flocks of up to 20 individuals (GHD 2012). Squatter pigeon is likely to be common in suitable habitat within the mine component of the Project Area, although the distribution of this species is likely to be limited by the availability of drinking water (GHD 2012).

2.2.5 Waxy cabbage palm

The waxy cabbage palm is known to occur only in tributaries of the Burdekin River (DEE 2018). The species occurs in the riparian zone of braided watercourses and associated permanent pools that flow ephemerally (DEE 2018). Associated tree species are *Corymbia brachycarpa*, river red gum (*Eucalyptus camaldulensis*), broad-leaved teatree (*Melaleuca leucadendra*) and *Pandanus* sp. (DEE 2018).

Within the Project Area, waxy cabbage palms have been recorded throughout the length of the Carmichael River (GHD 2013). Surrounding the Project Area waxy cabbage palms have also been recorded upstream to approximately Joshua springs and Moses Springs, through to approximately 2 km south of the Project Area (GHD 2013). The population of waxy cabbage palm within the Carmichael River in the vicinity of the Project Area was estimated at 831 individuals (GHD 2013).

2.2.6 Yakka skink

The yakka skink is endemic to Queensland where it has a patchy distribution (DEE 2018). Isolated populations occur throughout sub-humid areas in the interior of Queensland from the Culgoa area near the NSW border in the south, to Coen and Cape York in the north (DEE 2018). The core habitat of this species is within the Mulga Lands and Brigalow Belt South Bioregions, although populations have been recorded throughout the Brigalow Belt North and Einasleigh Uplands Bioregions (Ferguson & Mathieson 2014).

Important yakka skink populations occur where colonies are identified or within 5 km of known records of the species. With respect to the Significant Impact Guidelines and previous searches (GHD 2012), the Project Area does not currently support an 'important population' of the EPBC Act-listed yakka skink . However this species is extremely cryptic, forages close to the burrow system, and is easily overlooked by anyone not skilled in observing signs of yakka skink colonies (Ferguson & Mathieson 2014; Wilson 2015).

The yakka skink is found in open dry sclerophyll forest or woodland, where microhabitats provide sheltering and burrowing opportunities for colonies (DEE 2018). Known woodland habitats include poplar box (*Eucalyptus populnea*), mulga (*Acacia aneura*), white cypress pine (*Callitris glaucophylla*) (usually in association with eucalypts such as poplar box, silver-leaved ironbark (*Eucalyptus melanophloia*), or carbeen (*Corymbia tessellaris*)), ironbark (typically silver-leafed ironbark), and disturbed, treated and cleared areas where suitable microhabitat features remain (Ferguson & Mathieson 2014). This species has also been recorded, though less frequently, in brigalow (*Acacia harpophylla*), bendee (*Acacia catenulata*), belah (*Casuarina cristata*), gidgee (*Acacia cambagei*), lancewood (*Acacia shirleyi*), and buloke (*Allocasuarina luehmannii*) woodlands (Ferguson & Mathieson 2014; DEE 2018).

Yakka skink habitat associations are poorly known in the north of its range – Einasleigh Uplands, Wet Tropics, and Cape York Peninsula (Ferguson & Mathieson 2014). Currently known woodland habitats

in these areas include spotted gum (*Corymbia citriodora*), granite ironbark (*Eucalyptus granitica*), blotchy ironbark (*Corymbia stockeri*), broad-leaved stringybark (*Eucalyptus acmenoides*), deciduous vine thicket, and white's ironbark (*Eucalyptus whitei*) (Ferguson & Mathieson 2014).

The Department considers that an occurrence of important habitat for the yakka skink is a surrogate for an 'important population' of this species (DEE 2018). Important habitat for the yakka skink is any contiguous patch of suitable habitat, particularly remnant vegetation, where a colony is known or identified (DSEWPaC 2011).

The Project area is located within the 'likely to occur' region of the yakka skink distribution (DSEWPaC 2011). There is suitable habitat for the yakka skink across the Project Area (GHD 2012), and the nearest known yakka skink location is 70 km to the southwest (DES 2018). Therefore, it is considered likely that the yakka skink occurs across the Project Area (GHD 2012). To date, yakka skinks have not been detected in the Project Area (GHD 2012; ELA 2015a; E2M 2017b).

2.3 Species recovery information - threats

Threats to each MNES that have been identified within conservation advices, national recovery plans and the *Burdekin Natural Resource Management Region - Back on track actions for biodiversity* report (DERM 2010), are identified within Table 1. Key threats that have been identified for four or more of the MNES include:

- Land clearing and fragmentation
- Inappropriate grazing regimes
- Inappropriate fire regimes
- Pest flora
- Feral pigs; and
- Introduced predators (cats and foxes).

Table 1: Summary of identified threats for each MNES

Threats	Black-throated Finch (southern)	Brigalow ecological community	Ornamental snake	Squatter pigeon (southern)	Waxy cabbage palm	Yakka skink
Land clearing and fragmentation	Yes[2]	Yes[1]	Yes[1] (major[3])	Yes[1]	Yes[1]	Yes[1] (known threat[4])
Inappropriate fire regimes	Yes[2] (major[3])	Yes[1]			Yes[1]	Yes (major[3])
Pest flora	Yes[2] (minor[3])	Yes[1]		Yes (buffel grass)[1]	Yes[1]	

Threats	Black-throated Finch (southern)	Brigalow ecological community	Ornamental snake	Squatter pigeon (southern)	Waxy cabbage palm	Yakka skink
Feral pigs	Yes[2]	Yes[1]	Yes[1] (major[3])		Yes (minor[3])	
Introduced predators (cats and foxes)	Yes[2] (minor[3])	Yes[1]		Yes[1]		Yes[1] (minor[3])
Other Pest fauna	Yes (rabbit grazing)[2]		Yes[1] (cane toads - major[3], known threat[4])			
Inappropriate grazing regimes	Yes[2] (major[3])	Yes[1]	Yes (known threat - trampling[4])	Yes[1]	Yes[1] (major[3])	Yes (major[3])
Climate change		Yes[1]				
Illegal trapping	Yes[2] (minor[3])					
Hybridisation	Yes[2]					
Site/road maintenance, including removal of microhabitat features						Yes[1] (minor[3], known threat[4])

[1] Threats identified in MNES specific Conservation Advice (DEE 2018).

[2] Threats identified in the *National recovery plan for the black-throated finch southern subspecies Poephila cincta cincta* (Black-throated Finch Recovery Team et al. 2007).

[3] Major and minor threats for certain species are identified in the *Burdekin Natural Resource Management Region - Back on track actions for biodiversity* report (DERM 2010).

[4] Draft Queensland Brigalow Belt Reptile Recovery Plan (Richardson 2008).

2.4 Existing research gap analysis

A gap analysis has been conducted to identify gaps relating to the current knowledge and understanding of each MNES, especially within the Galilee Basin region, that the Carmichael Conservation and Research Program may address. The gap analysis has reviewed information contained in:

- relevant recovery plans
- conservation and listing advice
- existing scientific studies and research completed for each MNES; and
- completed and future baseline studies, monitoring, management plans and research associated the Carmichael Mine project.

The gap analysis is provided in Table 2 and discussed in Sections 2.4.1 to 2.4.6.

Table 2: Published literature addressing research priorities identified in National Recovery Plans and Conservation Advices

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
BTF	Investigate breeding requirements and threats to key breeding areas.	• Movement patterns, home range size and habitat selection of an endangered resource tracking species, the black-throated finch (*Poephila cincta cincta*) (Rechetelo *et al.* 2016). • Genetic structure and diversity of the black-throated finch (*Poephila cincta*) across its current range (Tang *et al.* 2016).	• BTF research program.	**Moderate** – breeding requirements for BTF populations within the Project Area and the Townsville region have been studied; however, limited research has been conducted on breeding requirements in the broader Galilee Basin area to date. **This will be a component of the studies carried out under the Carmichael Mine BTF Research Plan.**
	Investigate feeding and other habitat requirements.	• Movement patterns, home range size and habitat selection of an endangered resource tracking species, the black-throated finch (*Poephila cincta cincta*) (Rechetelo *et al.* 2016). • The Black-throated finch Poephila cincta in New South Wales (Meyer & Agnew 2012). • Foraging ecology of the black-throated finch *Poephila cincta cincta* (Mitchell 1996).	• BTF research program. • Wet and dry season monitoring reports (Niche 2015a; b; c, 2016; ELA 2016a; E2M 2017a, 2018). • BTF monitoring program.	**Moderate** – feeding and other habitat requirements for BTF populations within the Project Area and the Townsville region have been studied; however, limited research has been conducted on feeding and other habitat requirements in the broader Galilee Basin area. **This will be a component of the studies carried out under the Carmichael Mine BTF Research Plan.**

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Document sightings.	• 'Report a sighting' form on the BTF Recovery Team Website. • Atlas of Living Australia species records (ALA 2018). • WildNet species records (DES 2018).	• Wet and dry season monitoring reports (Niche 2015a; b; c, 2016; ELA 2016a; E2M 2017a, 2018).	**Moderate** – Methods have been established to promote the reporting of BTF sightings. However; knowledge of BTF distribution in the Galilee Basin outside of the Project Area is limited.
	Develop standard survey guidelines.	• Survey guidelines for Australia's threatened birds (Department of the Environment, Water, Heritage and the Arts 2010).	• Wet and dry season monitoring reports (Niche 2015a; b; c, 2016; ELA 2016a; E2M 2017a, 2018).	**Moderate** – survey methods have been reviewed and assessed during monitoring completed to date for the Project.
	Undertake mapping and habitat modelling.	• Movement patterns, home range size and habitat selection of an endangered resource tracking species, the black-throated finch (*Poephila cincta cincta*) (Rechetelo *et al.* 2016).	• BTF research program.	**Moderate** – habitat studies have been conducted for BTF populations within the Project Area and in the Townsville region; however, limited research has been conducted on BTF populations in the broader Galilee Basin area.

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Undertake targeted surveys.	• The Black-throated finch *Poephila cincta* in New South Wales (Ley & Cook 2001).	• BTF research program. • Wet and dry season monitoring reports (Niche 2015a; b; c, 2016; ELA 2016a; E2M 2017a, 2018). • BTF monitoring program.	**Moderate** – habitat studies have been conducted for BTF populations within the Project Area and the Townsville region; however, limited research has been conducted on BTF populations in the broader Galilee Basin area.
	Secure selected sites for conservation.	-	*Biodiversity Offset Strategy, Carmichael Coal Mine and Rail Project, Adani Mining Pty Ltd* (August 2016) (BOS (Moray Downs West).	**Limited** – with the exception of the BOS for the Project Area, limited research has been conducted on optimal BTF conservation sites.

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Address threats on grazing lands.	-	• BTF research program. • BOS (Moray Downs West).	**Limited -** the BTF Research Program will aim to address this and provide management strategies for offset areas.
	Monitor management effectiveness.	-	• BTF research program. • BTF monitoring program. • BOS (Moray Downs West).	**Limited** – However, the BTF Monitoring Program and Species Management Plan for the Project Area includes monitoring strategies to feed into the adaptive management of BTF in the Project and offset areas.
	Investigate development of other statutory planning instruments to minimise impacts of development on BTF.	• Addressing potential cumulative impacts of development on threatened species: the case of the endangered BTF (Vanderduys *et al.* 2016).	-	**Moderate** – only one relevant study completed
	Determine suitability of birds currently in captivity for a reintroduction project.	-	-	**Limited** – no previous studies

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Increase public awareness of the status of and threats to the subspecies.	• Numerous initiatives by the BTF Recovery Team, Birds Queensland and Birdlife Australia, including an annual waterhole count and publishing BTF fact sheets.	-	**Substantial** – as listed

Brigalow ecological community	How to successfully restore or reclaim degraded brigalow communities. and Investigate methods to assist advanced regrowth to attain the structural and floristic characteristics of remnant brigalow.	• Restoration potential of brigalow regrowth: Insights from a cross-sectional study in southern Queensland (Chandler, Buckley & Dwyer 2007). • The effects of temperature and salinity on Acacia harpophylla (brigalow) (Mimosaceae) germination (Reichman, Bellairs & Mulligan 2006). • Restoration thinning accelerates structural development and carbon sequestration in an endangered Australian ecosystem (Dwyer, Fensham & Buckley 2010). • Reproductive size thresholds and seedling survival in *Acacia harpophylla* (Mimosaceae) (Dwyer 2017). • Plant community responses to thinning in densely regenerating *Acacia harpophylla* forest (Dwyer & Mason 2018). • Hydropedology and ccohydrology of the Brigalow Belt, Australia: opportunities for ecosystem rehabilitation in semiarid environments (Arnold *et al.* 2013). • Germination of *Acacia harpophylla* (brigalow) seeds in relation to soil water potential: implications for	-	**Substantial** – as listed

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
		rehabilitation of a threatened ecosystem (Arnold, Kailichova & Baumgartl 2014). • Effects of local-scale management on herbaceous plant communities in brigalow (*Acacia harpophylla*) agroecosystems of southern Queensland, Australia (Collard, Le Brocque & Zammit 2011). • Ecohydrological feedback as a land restoration tool in the semi-arid Brigalow Belt, QLD, Australia (Arnold, Thornton & Baumgartl 2012). • Changes over 46years in plant community structure in a cleared brigalow (*Acacia harpophylla*) forest (Johnson *et al*. 2016).		

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	How best to manage some of the more serious plant and animal pests and their impacts.	• Queensland Government pest management factsheets. • Environmental Weeds of Australia: an interactive identification and information resource (2008). • Various Local Government pest management plans.	-	**Substantial** information has been published on the management of plant and animal pests relevant to the region.
	How climate change is affecting the ecological community.	• Effects of land-use change and management on soil carbon and nitrogen in the Brigalow Belt, Australia: I. Overview and inventory (Allen *et al.* 2016). • Effects of land-use change and management on soil carbon and nitrogen in the Brigalow Belt, Australia: II. Statistical models to unravel the climate-soil-management interaction (Pringle *et al.* 2016). • Carbon for conservation: Assessing the potential for win-win investment in an extensive Australian regrowth ecosystem (Dwyer *et al.* 2009).	-	**Moderate** – several studies related to climate change have been undertaken

	The condition of the remaining areas of the Brigalow ecological community	• The age and amount of regrowth forest in fragmented brigalow landscapes are both important for woodland dependent birds (Bowen *et al.* 2009b). • Passive brigalow (Acacia harpophylla) woodland regeneration fails to recover floristic composition in an agricultural landscape (Le Brocque & Wagner 2018). • Integration of radar and Landsat-derived foliage projected cover for woody regrowth mapping, Queensland, Australia (Lucas *et al.* 2006). • Effects of local-scale management on herbaceous plant communities in brigalow (*Acacia harpophylla*) agroecosystems of southern Queensland, Australia (Collard, Le Brocque & Zammit 2011). • Bird assemblages in fragmented agricultural landscapes: the role of small brigalow remnants and adjoining land uses (Collard, Le Brocque & Zammit 2009). • Agricultural landscape modification increases the abundance of an important food resource: Mistletoes, birds and brigalow (Bowen *et al.* 2009a).	-	**Substantial** – as listed

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
		• Queensland remnant and high-value regrowth mapping and associated Regional Ecosystem descriptions (Department of Environment and Science 2018b).		
	Collating existing data, and completing the mapping necessary to provide coverage of the ecological community (particularly in NSW).	• Vegetation of the Barwon-Darling and Condamine-Balonne floodplain systems of New South Wales (ELA 2016b). • BioNet vegetation maps (Office of Environment and Heritage 2018).	-	**Not relevant to Galilee Basin**
	Establish condition benchmarks across the range of the Brigalow ecological community for each of the component vegetation communities.	• Galilee Basin Ecosystem Benchmarking Project (DSITIA 2014) • Biocondition benchmarks for regional ecosystem condition assessment (Department of Science, Information Technology and Innovation 2012). • Regional Ecosystem technical descriptions (Department of Environment and Science 2018b).	-	**Substantial** – as listed

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Survey and continue to monitor a representative set of sites in Qld and NSW to assess condition and to identify relevant threats	-	-	**Limited** – no known studies previously undertaken
	Identify, prioritise and map important areas for Brigalow conservation in Qld and NSW.	• Estimating clearance of Acacia-dominated ecosystems in central Queensland using land-system mapping data (Fensham, McCosker & Cox 1998). • The conservation status of Queensland's bioregional ecosystems (Sattler & Williams 1999).	-	**Moderate** – no known recent studies have been undertaken although Queensland RE mapping is regularly reviewed.
	Undertake monitoring to ensure and encourage compliance with legislation that protects the Brigalow ecological community.	• Estimating clearance of Acacia-dominated ecosystems in central Queensland using land-system mapping data (Fensham, McCosker & Cox 1998). • Carbon for conservation: Assessing the potential for win-win investment in an extensive Australian regrowth ecosystem (Dwyer *et al.* 2009).	-	**Moderate -** Queensland RE mapping is regularly reviewed.

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
Ornamental snake	More precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes.	• Assessment of seasonal habitat characteristics as predictors of habitat suitability for the threatened ornamental snake (Veary 2011). • Food habits and reproductive biology of Australian elapid snakes of the genus Denisonia (Shine 1983). • Assessing the potential impact of cane toads on Australian snakes (Phillips, Brown & Shine 2003).	-	**Moderate** – studies have only addressed components of this priority
	Design and implement a monitoring program in key habitat and priority conservation areas	-	-	**Limited** – no known studies previously undertaken
	Monitor known populations to identify key threats.	-	-	**Limited** – no known studies previously undertaken
	Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.	-	-	**Limited** – no known studies previously undertaken

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
Squatter pigeon (southern)	Extensive surveys across the southern part of the subspecies' range.	• Bird communities in remnant woodland on the upper North-west Slopes of New South Wales (Debus, Ford & Tramont 2006).	-	**Limited** – one study in NSW
	Studying the breeding behaviours of the subspecies and the vegetation types that characterise the subspecies' breeding habitat.	• Breeding, moult and food of the squatter pigeon in north-eastern Queensland (Crome 1976).	-	**Limited** – one study over 40 years ago
	Assessing the subspecies' reproductive success and the factors that affect this.	-	-	**Limited** – no known studies previously undertaken
	Studying the subspecies' movement dynamics and the drivers behind these movements (including seasonal and longer term movements).	• Fluctuations in the population of the Squatter Pigeon '*Geophaps scripta*' at Coen, Cape York Peninsula (Garnett *et al.* 1998).	-	**Limited** – one study for the northern subspecies
	Studying home ranges, patch sizes and the relationship of these with habitat quality.	-	-	**Limited** – no known studies previously undertaken

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Studying the subspecies' diet and identifying preferred food plants.	-	-	**Limited** – no known studies previously undertaken
	Studying the extent to which the Squatter Pigeon (southern) utilises modified or degraded habitats for foraging, breeding or dispersal.	-	-	**Limited** – no known studies previously undertaken
	Studying the ability of the subspecies to utilise introduced plant species as food resources.	-	-	**Limited** – no known studies previously undertaken
	Studying the responses of food plant species to fire and grazing regimes.	-	-	**Limited** – no known studies previously undertaken
	Refining survey techniques.	• Survey guidelines for Australia's threatened birds (Department of the Environment, Water, Heritage and the Arts 2010).	-	**Moderate** – no specific studies

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
Waxy cabbage palm	Design and implement a monitoring program.	-	• Groundwater Dependent Ecosystem Management Plan • Great Artesian Basin Springs Research Plan	**Limited -** This will be a component of the Carmichael Mine Groundwater Dependent Ecosystem Management Plan.
	More precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes.	• The Project Supplementary Environmental Impact Statement, report for population survey of waxy cabbage palm (GHD 2013). • Distribution and population structure of the vulnerable riparian palm *Livistona lanuginosa* A. N. Rodd (Arecaceae) in the Burdekin River catchment, North Queensland (Pettit & Dowe 2003). • Notes on endangered and vulnerable Australian palms: *Livistona lanuginosa* Rodd (Dowe 2007).	• Groundwater Dependent Ecosystem Management Plan • Great Artesian Basin Springs Research Plan	**Moderate** – The population size, distribution and ecological requirements of the species within and near the Project Area has been studied. However, research into the species in the greater Burdekin catchment is limited.

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Undertake grazing exclusion experiments to conclusively determine livestock grazing effects.	-	-	**Limited** – no known studies previously undertaken
Yakka skink	More precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes.	• Life-history characteristics of the yakka skink, *Egernia rugosa*, indicate long-term social structure (Peck *et al.* 2016). • Ecology, life-history, and behavior in the Australian scincid genus Egernia, with comments on the evolution of complex sociality in lizards (Chapple 2003).	-	**Moderate** – However, there is limited available information on the distribution of yakka skink within the Galilee Basin.
	Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences/ remnants.	-	-	**Limited** – no known studies previously undertaken

Species	Research priority/objective identified in National Recovery Plans and Conservation Advices	Published literature addressing research objectives	Studies/research required as conditions of other approvals for the Project	Assessment of research coverage
	Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.	-	-	**Limited** – no known studies previously undertaken

2.4.1 Black-throated Finch (southern)

The *national recovery plan for the Black-throated finch southern subspecies (Poephila cincta cincta)* (Black-throated Finch Recovery Team et al. 2007) identifies specific objectives to manage and protect the BTF and its habitat, and to promote the recovery of the southern subspecies. A gap analysis of existing information (Section 2.4) identified the following research priorities that have limited existing research:

- Threats that grazing regimes pose to BTF
- Identification of priority sites for conservation outside of offset areas already identified for the Project
- Determine suitability of birds currently in captivity for a reintroduction project.

In addition, there has been limited research on breeding, feeding and other habitat requirements for BTF outside of the Project Area.

2.4.2 Brigalow Threatened Ecological Community

The DEE has published conservation advice for the brigalow TEC, which identifies threats, research priorities and management actions to promote the recovery of the ecological community. A gap analysis of existing information (Section 2.4) identified one research priority that had limited existing research. Specifically, the research priority is to survey and continue to monitor a representative set of sites in Qld and NSW to assess condition and to identify relevant threats.

The brigalow ecological community provides habitat for other MNES, including ornamental snake and yakka skink. Opportunity exists to conduct Research Projects within the brigalow ecological community that are mutually beneficial for MNES that inhabit this community.

2.4.3 Ornamental snake

Research that has been conducted on ornamental snake has included assessment of the habitat, movement and distribution of ornamental snake, particularly within central Queensland (Veary 2011). A gap analysis of existing information (Section 2.4) identified the following research priorities that have limited existing research:

- Design and implement a monitoring program in key habitat and priority conservation areas.
- Monitor known populations to identify key threats.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

2.4.4 Squatter pigeon (southern)

While the species has been recorded and assessed within numerous ecological studies undertaken primarily for resource projects within the region (ELA 2015b), there has been little research addressing priority research questions for the species (Section 2.4). A gap analysis of existing information (Section 2.4) identified the following research priorities that have limited existing research:

- Extensive surveys across the southern part of the subspecies' range.
- Studying the breeding behaviours of the subspecies and the vegetation types that characterise the subspecies' breeding habitat.

- Assessing the subspecies' reproductive success and the factors that affect this.
- Studying the subspecies' movement dynamics and the drivers behind these movements (including seasonal and longer-term movements).
- Studying home ranges, patch sizes and the relationship of these with habitat quality.
- Studying the subspecies' diet and identifying preferred food plants.
- Studying the extent to which the Squatter Pigeon (southern) utilises modified or degraded habitats for foraging, breeding or dispersal.
- Studying the ability of the subspecies to utilise introduced plant species as food resources.
- Studying the responses of food plant species to fire and grazing regimes.

2.4.5 Waxy cabbage palm

The distribution, population size and structure of waxy cabbage palm populations have been assessed within the Project Area, immediately upstream and downstream (GHD 2013) and to a lesser extent within the greater Burdekin catchment (Pettit & Dowe 2003). A gap analysis of existing information (Section 2.4) identified the following research priorities that have limited existing research:

- Assess population size and distribution, particularly across the entire Burdekin catchment.
- Assess the ecological requirements and the relative impacts of threatening processes.
- Undertake grazing exclusion experiments to conclusively determine livestock grazing effects

2.4.6 Yakka skink

Research that has been conducted on yakka skink has focused on the ecology, life-history, and behavior of yakka skink. The species has been sparsely recorded and researched within the Galilee Basin (DES 2018a). A gap analysis of existing information (Section 2.4) identified the following research priorities that have limited existing research:

- More precisely assess population size, distribution, ecological requirements and the relative impacts of threatening processes.
- Undertake survey work in suitable habitat and potential habitat to locate any additional populations/occurrences/remnants, with a focus on suitable habitat in the Galilee Basin.
- Monitor the progress of recovery, including the effectiveness of management actions and the need to adapt them if necessary.

2.5 Initial research work plan

The Program will be implemented through commissioning research that addresses the objective. Project/s will be developed and designed to address known threats and knowledge gaps with an aim to provide outcomes that will benefit the conservation of MNES. This research will identify measures to mitigate and manage impacts to MNES. Research may also identify practices that will benefit the management offset areas for the relevant MNES. Research will be carried out over a period of up to 10 years.

Annual reporting will document the progress of the research project/s and be provided to the Department for review. A 5 Year review will be undertaken to assess the progress of the project/s with a report provided to the Department.

The initial research work plan included in this Program will deliver the priority research in accordance with section 2.6, and be implemented in accordance with the program schedule in section 2.7.

2.6 Prioritisation of research topics

2.6.1 Baseline surveys

Baseline surveys should give consideration to, where relevant, each species' life history, movement patterns, habitat requirements and population dynamics and other aspects of their ecology. They may consist of surveys to assess the following:

- Presence / absence of MNES
- Condition of MNES habitat
- Landscape scale review of existing information and spatial and temporal patterns with respect to fire and grazing
- Abundance, distribution and use of habitat under existing grazing regimes, and small-scale experimental trials or manipulations
- Changes in habitat in relation to fire and grazing using existing data and small-scale manipulations
- Monitoring of habitat condition and utilisation.

Survey methodologies will be required to be undertaken in accordance with the Department's survey guidelines, or alternative best practice methodologies that are agreed to in writing by the Minister prior to commencement and endorsed by a suitably qualified independent expert.

Where a Research Proposal includes alternative best practice methodology, an explanation and an endorsement by a suitably qualified independent expert must be provided to the Steering Committee for their consideration. If the Steering Committee agrees to the proposed alternative best practice methodology, the Proponent must obtain agreement in writing from the Minister for the alternative best practice methodology.

2.6.2 Priority research topics

Potential research topics, as at November 2018, have been determined by a gap analysis of existing research and literature, a review of known threats and potential for benefits for the management and mitigation for MNES. The gap analysis identified numerous limitations in studies that have been identified in the recovery plans and listing advice for the MNES. Potential research topics and actions have been prioritised based on the following:

- potential benefits to the recovery of multiple MNES
- existing threats and risk of population decline addressed
- conservation and listing status under the EPBC Act and *Nature Conservation Act 1992* (Qld)
- complementary to existing baseline surveys, monitoring and research programs required for the Project; and
- difficulty and cost of research actions.

Table 3 outlines the priority research topics for this Program. The highest priority research topics that benefit multiple MNES are related to the effects of grazing and fire management on MNES and particularly the Black-throated finch (southern), Brigalow TEC, Waxy cabbage palm and Yakka skink.

Table 3: Priority research topics

Research topic/questions	Threats addressed	MNES (species listing)	Existing research coverage	Overall Research Priority
Grazing management Determine the effect of cattle grazing on MNES and their habitat by undertaking small scale experimental trials to understand how they respond to different grazing management regimes.	Inappropriate grazing regimes	BTF Brigalow TEC Waxy cabbage palm Yakka skink	Limited	High
Fire management Determine the effects of fire regimes on MNES and their habitat by undertaking small scale experimental trials to identify the optimal regimes to enhance or protect habitat.	Inappropriate fire regimes	BTF Brigalow TEC Waxy cabbage palm Yakka skink	Limited	High
Survey and monitoring 1) Undertake survey work in suitable habitat and potential habitat to locate any additional populations and more accurately estimate the distribution and population sizes of MNES.	Monitoring program to link to identified threats for MNES	All MNES but especially BTF, Waxy cabbage palm and Yakka skink	Limited	High

Research topic/questions	Threats addressed	MNES (species listing)	Existing research coverage	Overall Research Priority
2) Design and implement a monitoring program for MNES within the Galilee Basin.				

To meet condition 18(g) of the EPBC Approval, the identification of priority actions for funding will be decided in consultation with the Queensland Department of Environment and Science (formerly the Queensland Department of Environment and Heritage Protection) and members of relevant Recovery Teams. This process is described in the Terms of Reference for the Steering Committee.

2.6.3 Criteria for assessing Research Project applications

The Program aims to provide for research that will benefit the mitigation and management of these MNES by:

- Developing a transparent process to identify research priorities and actions for the relevant MNES in the Galilee Basin area
- Providing benefits to multiple MNES
- Addressing known threats, research priorities and knowledge gaps that are relevant to the Galilee Basin
- Identifying suitably practical and cost-efficient research actions; and
- Building on existing baseline surveys, monitoring and research programs.

Research Project applications will be assessed by the Steering Committee with consideration given to the following criteria, the weighting of which will predominantly be with regards to ensuring compliance with the specific requirements of the EPBC Approval:

- ability of the proposal to meet the objectives of this Program
- contribution of the project to multiple MNES within the Galilee Basin, ensuring a regional approach
- provide potential benefits for managing and mitigating impacts to MNES
- time and budget required to complete the Research Project
- ability to leverage existing or future Research Projects and funding
- feasibility of the Research Project to be completed within the proposed time and budget
- practicality for implementation of the Research Project
- adequacy of proposed research methods; and
- skills and experience of the Researcher/s.

2.7 Program Schedule

The Program will be funded over a ten year period, via the Fund, during which time Research Projects will be required to be completed and results delivered and reported.

Pre-commencement - Establish funding mechanism

The establishment of the Fund will occur prior to commencement of mining activities (See Section 3).

Year 1 – Establishment

Year 1 will coincide with the commencement of mining activities.

Year 1 will involve the establishment of the Steering Committee and administrative process. Research Project proposals will be sought for projects to fulfil the requirements and objectives of the Program.

Actions for Year 1 will include the following:

- establishment of the Fund including the initial contribution beginning from commencement of mining activities
- establishment of the Steering Committee
- consultation with the Queensland Department of Environment and Science and relevant recovery teams
- determination of research priorities
- request and evaluation of Research Projects to implement this Program
- if time permits, commencement of the Research Project/s.

Years 2 to 5 – Delivery

Years 2 to 5 will be focused on delivery of the Program, supporting a regional approach, and research outcomes, as agreed and designed approved by the Steering Committee in Year 1.

Actions for Years 2 to 5 will include the following:

- annual contributions to the Fund
- commencement of the Research Project/s (if not done so in Year 1)
- baseline surveys for the Research Projects, where relevant
- implementation of relevant experimental trials and field studies.

Year 5 – Review

A review of Research Projects and effectiveness of the Program must be undertaken five years after the establishment of the pool of funds and/or the commencement of the action, or as otherwise agreed by the Minister in writing. This review will:

- take into account progress of the Research Projects and any subsequent on ground actions
- the involvement of other holders of approvals under the EPBC Act in funding and administrative arrangements

- consider any implications for management actions detailed in documents such as the *Biodiversity Offset Strategy, Carmichael Coal Mine and Rail Project, Adani Mining Pty Ltd (August 2016)* (BOS), Species Management Plan, BTF Management Plan and Groundwater Dependent Ecosystem (GDE) Management Plan
- be provided to the Department within six months after the five year period.

Other actions undertaken during Year 5 will include:

- annual contribution to the Fund
- continuation of experimental trials and field studies.

Years 6 to 9 – Delivery

Years 6 to 9 will be focused on delivery of the Program and research outcomes, as agreed and designed approved by the steering committee in Year 5.

Actions for Years 6 to 9 will include the following:

- annual contributions to the Fund
- completion of experimental trials and field studies
- monitoring of MNES response to trials
- data analysis and reporting.

Year 10 – Finalization and Review

The Program will be finalized in Year 10 and a review subsequently undertaken. Actions undertaken during Year 10 will include:

- annual contribution to the Fund
- completion of data analysis and Research Project reports / papers
- final review of this Program.

The review will be led by the Steering Committee, who may elect to engage independent scientific researchers to contribute to the review. The results of the review will be provided to the Department within six months after the 10 year period.

The review will evaluate the following:

- dtatus of the Research Projects and Fund
- did the project/s meet the objectives of this Program
- potential for research outcomes to result in benefits to MNES
- consider any implications for management actions detailed in documents such as the BOS, Species Management Plan, BTF Management Plan and GDE Management Plan.

3 Galilee Basin Conservation and Research Fund

The Proponent established the Galilee Basin Conservation and Research Fund (the Fund) in order to meet its obligations under the EPBC Approval.

The Fund has also been designed to be available to any additional members that choose to sign up to the Fund, such as proponents with Commonwealth or Queensland Government environmental approvals that require contribution to a trust or fund mechanism, at the discretion of the Proponent.

The Fund has been established with a focus on the initial proponent, with the option to expand to include additional members (proponents). Should additional members seek to contribute to the Fund, further detail on its operation will be negotiated via the Steering Committee.

3.1 Fund mechanism

The Fund will be structured as a unit trust. A trust is formed where one party (a trustee) holds an asset or assets on behalf of others. One of the central features of a trust is the legal interest in the trust property is held by a trustee who has day to day control of assets.

The trustee must act in the interests of the trust's members, who have an equitable interest in that property. A unit trust is a structure where members of the unit trust will have a fixed interest in all property that is the subject of the unit trust. The unit trust fund mechanism was selected because it allows any third parties or other proponents to join the Fund.

Funding will be contributed by members of the Trust in exchange for units in the Trust. In a unit trust structure, funds are held by the Trustee on trust for the members of the Trust.

The Proponent is obligated under the terms of the Trust Deed to contribute funding in the manner required to meet the conditions of the EPBC Approval, ie $100,000 per annum, for 10 years, which may only be used to meet the objectives of this Program. Any other funds contributed by other members will be separately accounted for and will not be counted as a part of the Proponent's Fund contributions.

The Trust will provide funds to develop and implement appropriate research programs in accordance with environmental approvals of members of the Trust by redeeming the members' units. The order of how units will be issued and redeemed is as follows:

- as previously mentioned, the Proponent, and all members of the Trust, contribute funds to the Trust and are issued units in return
- the Trustee is responsible for issuing units to the Proponent and members of the Trust. The number and quantity of units issued to the Proponent, and other members, is at a rate of 1 unit for $1
- funds are held by the Trustee until such time as the Steering Committee has determined what should be done with the funds
- when the Steering Committee has determined how funds should be applied, it may then make a Redemption Request to the Trustee, and the Trustee then redeems members' units, and the proceeds of those units are paid directly in accordance with the Steering Committee's Redemption request

the proceeds of the redemption are then paid out by the Trustee in accordance with the decisions of that Steering Committee. For example, directly to a Researcher in accordance with a research Grant Agreement.

3.2 The Trustee

The Trustee is Galilee Biodiversity Company Pty Ltd. The Trustee will hold the funds (and any other assets, for example, intellectual property rights owned or licensed to the Fund that may be created through the carrying out of the research projects) on trust for the benefit of the members of the Trust.

The Trustee will owe certain fiduciary duties to the members of the Fund. The duties of Trustees of trusts, such as this Fund, are established within common law and legislation. The terms of the Trust Deed, the instrument establishing the Fund, also imposes certain obligations on the Trustee.

Generally, the Trustee's responsibilities are as follows:

- the Trustee of the Fund is legally obligated to ensure the objects of this Program are carried out diligently, effectively and to a high standard;
- it has a duty to preserve the trust property;
- it has a duty to act in good faith;
- it has a duty to consider whether to exercise a discretion.
- it has strict accounting monitoring and reporting obligations to the Proponent regarding the provision of reports in satisfaction of this Program.

The Trustee, as a proprietary company limited by shares, will also have certain obligations under the *Corporations Act 2001* (Cth).

The Trustee must ensure the funding it receives from members of the Trust is spent only for the purposes of undertaking Research Projects in accordance with each member's Program objectives.

The Steering Committee will review the applications by researchers and provide recommendations to the Trustee. The Trustee will aim to protect the interests of the members of the Trust and the Fund by entering into a Research Grant Agreement with each recipient of a research grant by the Fund.

3.3 Administration of the Fund

All funds received by the Trustee from its members of the Trust, including the Proponent, will be paid into a bank account opened by the Trustee of the Fund. The Trustee must keep records identifying the receipt and expenditure of funding. The Steering Committee will have a right to access the Trustee's records in relation to the Fund, and the Trustee must cooperate with any audit carried out by a proponent.

The Trustee is entitled to claim from the Fund, subject to approval by members of the Trust, reasonable expenses incurred in obtaining advice on the operation of the Fund, such as legal, accounting, financial and technical advice.

The Trustee may, in considering how best to preserve the Trust property, invest the funds, for example in an interest bearing account.

Subject to any investment advice received, it is intended that all funding which the Fund receives will be deposited in an at-call interest-bearing bank account in the name of the Trustee of the Fund. Moneys will only be invested in assets as permitted by applicable trust legislation.

The Trustee must keep records in accordance with Australian Accounting Standards that identify receipt and expenditure of the funding for each Program separately within the Trustee's accounting records so that at all times the funding is identifiable and ascertainable.

The Trustee is required to provide documentary evidence to the administering authority showing the contributions made by each member of the Trust to the Fund within 30 calendar days of each contribution.

The Trustee must liaise with and report regularly to the Steering Committee.

In the unlikely event of breach by the Trustee of its obligations, the terms of the Trust Deed provide certain contractual rights for the member/s of the Trust, which includes for the removal and appointment of a new Trustee.

The Proponent will provide administrative support (for example, secretariat support) for the Fund and Program, which the Trustee of the Fund is not otherwise entitled to recover from of the Fund.

After completion of all research projects commissioned from the Fund, any residual funds will be paid to another fund enabling research regarding threatened species and communities, as recommended by the Steering Committee, and in accordance with the objectives of each Program.

3.4 Steering Committee

The Steering Committee will act as an advisory group for the Fund, providing input and recommended directions to the Trustee around the management of the pool of funds to optimise research for threatened species and communities in the Galilee Basin. This Steering Committee will provide this input and oversight regardless of the number of Programs or members of the Trust.

The terms of reference for the Steering Committee for the Fund are included in **Attachment 3**. It is envisaged that the Steering Committee will prepare and issue to the public or specific researchers a request for proposal detailing the research grant or grants available. Applicants responding to a request for proposal will be required to submit Research Project proposals, in a way and at a time determined by the Steering Committee, to undertake Research Projects that address the research topics identified previously.

The Steering Committee will review the applications and make recommendations to the Trustee about how the funds are to be distributed.

3.5 Contact with Media

Proponents reserve the right to publicise and report on the provision of funding. The Trustee and other members of the Trust must obtain the Proponent's agreement before releasing any announcements, or conducting any publicity events for the Program.

3.6 Delivering Research Projects

3.6.1 Management of Research Projects

Researchers will be required to sign agreements (Research Grant Agreement) with the Trustee governing the obligations of the parties about the management of Research Projects, prior to receiving funds from the Fund. The Research Grant Agreement will, at minimum, outline outcomes to be delivered, timeframes, and how the Research Project addresses the Proponent's research obligations under the relevant environmental approval and ownership of any intellectual property rights created.

3.6.2 Publication of research

Where possible, and appropriate, Research Project results will be published.

Research will be published in an agreed way, time and location, as per the signed Research Grant Agreement. This may include a requirement to submit the results of the research for publication in peer reviewed journals. Outcomes of all Research Projects will be published on the Proponent's website.

3.7 Reporting

Annual reporting will be provided by the Proponent to the Department to document the progress of research activities, notable results of baseline and monitoring surveys and the status of the Fund.

A report will be prepared at the completion of Research Projects to document the methods, results, conclusions and relevant management recommendations and submitted to the Steering Committee for review. The report will be published on the Proponent's website.

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Appendix 1 – Relevant EPBC Act approval 2010/5736 conditions and how addressed

Approval & condition number	Description of Condition or Commitment	How Addressed	Section of Program
EPBC Act Approval, condition 15	The approval holder must establish and/or contribute to a pool of funds established for the better protection and long term conservation of EPBC Act listed threatened species and communities listed in Table 1.	Entire Program	Entire Program
EPBC Act Approval, condition 16	The mechanism to establish and/or contribute to a pool of funds, including terms of reference to support a regional approach, funding mechanisms and an initial work plan, must be provided to the Minister for approval three months prior to commencement of mining operations. The mechanism may be in the form of a trust fund, or other mechanism/s as agreed by the Minister in writing.	The mechanism will be a trust fund that holds a pool of funds, as contributed by the Proponent (section 2.1). The terms of reference are outlined in Appendix 3. The program and outlines how the projects will support a regional approach and an initial work plan in sections 2.6 and 2.8. The funding mechanism put forward is a trust mechanism as there are no existing mechanisms that cover the scope of matters required to be delivered by the condition of the approval, as outlined in section 3.	Sections 2.1, 2.6, 2.8 and 3 Appendix 3
EPBC Act Approval, condition 17	The approval holder must contribute $100 000 (GST exclusive) per annum for 10 consecutive years to the pool of funds beginning from commencement of mining activities. The approval holder must provide notice of the establishment of and/or contribution to the pool of funds to the Department in writing prior to commencement of mining activities. Documentary evidence must be provided to the	The process for contribution and the trust fund governance are included in Section 3. The notice of establishment of the trust fund will be attached to the letter to the Department. Documentary evidence will be provided to the Department at that time of the transfer of the $100,000 to the trust fund.	Section 3

Approval & condition number	Description of Condition or Commitment	How Addressed	Section of Program
	Department showing that the annual financial contributions to the pool of funds have been provided within 30 calendar days of each payment.		
EPBC Act Approval, condition 18	These funds must facilitate the development and implementation of research programs consistent with priorities to manage development impacts on EPBC Act listed threatened species and communities listed in Table 1 which are consistent with, and take into consideration, any relevant recovery plans, threat abatement plans and/or conservation advices. Research programs should identify measures to mitigate and manage the impacts on EPBC Act listed threatened species and communities listed in Table 1 and should address:	The Research Program has been developed to address relevant threats and knowledge gaps that will facilitate measures to mitigate and manage the impacts for MNES identified in Table 1 of the EPBC Approval. Section 2.2 describes the MNES. Key threats to each of the MNES identified within conservation advices, national recovery plans and the Burdekin Natural Resource Management Region are included in section 2.3. Existing research gaps per species are located in section 2.4. From that gap analysis, an initial research work plan is included in section 2.5, with the process of prioritisation of research topics included in section 2.6.	Sections 2.2 to 2.6
EPBC Act Approval, condition 18 a)	methodologies for a baseline survey that will report on each species' life history, movement patterns, habitat requirements and population dynamics. Survey methodologies must be in accordance with the Department's survey guidelines or alternative best practice methodologies that are agreed to in writing by the Minister prior to commencement and endorsed by a suitably qualified independent	The research project/s will be required to include baseline surveys that build upon and complement any relevant surveys and research programs required for the Project. These surveys should give consideration to, where relevant, each species' life history, movement patterns, habitat requirements and population dynamics. Survey methodologies will be required to be undertaken in accordance with the Department's survey guidelines. Where alternative methodologies	Section 2.7

Approval & condition number	Description of Condition or Commitment	How Addressed	Section of Program
	expert. The baseline survey must begin with the first year of the date of this approval	are proposed, they must be endorsed by a suitably qualified independent expert and agreed to in writing by the Minister prior to commencement.	
EPBC Act Approval, condition 18 b)	an ongoing monitoring program (developed from the baseline monitoring) for each species, to continue for the duration of the project approval, with annual reporting to the Department	The research project/s will be required to include baseline surveys that build upon and complement any relevant surveys and research programs required for the Project. These surveys should give consideration to, where relevant, each species' life history, movement patterns, habitat requirements and population dynamics.	Sections 2.5 and 2.7
EPBC Act Approval, condition 18 c)	commitments, including financial commitments and associated timeframes, that will be implemented by the approval holder to support the undertaking of research	The commitments, including financial commitments such as the contribution of funds, and additional administrative support for the undertaking of research are outlined in various sections of the program.	Sections 2.1, 2.6 and 2.8

Appendix 2 – Table 1 from EPBC Act approval 2010/5736

Table 1. Minimum offset areas required for **impacts** on **EPBC Act listed threatened species and communities** and initial contribution to offsets for **subsidence impacts** from underground mining.

Environmental value	*Offset for **mining operations** north of **Carmichael River** (hectares)*	*Offset for **mining operations** south of **Carmichael River** (hectares)*	*Initial offset for underground mining component (hectares)*	*Offset for off-lease infrastructure (hectares)*	*Offset for **rail east** component (hectares)*	*Offset for **rail west** component (hectares)*
Black throated finch (southern)	18 204.06	10 739.39	2,000.00	7.62	2.44	46.48
Brigalow ecological community	15.12	721.11		0.00	6.26	72.50
Ornamental snake	96.39	38.61		0.00	0.00	0.00
Squatter pigeon (southern)	1598.00	902.00		0.00	0.00	0.00
Waxy cabbage palm	90.00	0.00		0.00	0.00	0.00
Yakka skink	3770.48	1815.42		1.87	0.60	11.63

Note: *Offsets for different species may overlap where they share the same habitat requirements.*

Appendix 3 - Terms of Reference for the Steering Committee of the Fund

1. Purpose

The Steering Committee will act as an advisory group for the Fund, providing input and recommended directions to the Trustee regarding the use of funds to undertake research for threatened species and communities in the region of the Galilee Basin. The Steering Committee will provide this input and oversight regardless of the number of Programs or members of the Trust.

2. Authority

The Trustee will establish a Steering Committee whose membership, role and responsibilities are set out in these terms of reference.

3. Accountabilities

The Steering Committee of the Fund is accountable to the Trustee, and where applicable the committee member's relevant administering authority, for meeting its responsibilities. The Steering Committee's responsibilities are to:

- set and review research priorities to best address the relevant conditions of each Steering Committee member's environmental approvals
- review, assess and approve Research Project proposals seeking funding from the Fund
- manage Research Grant Agreements to ensure Research Projects deliver the outcomes under approved Programs
- prepare and approve budgets for each financial year for the Fund

4. Steering Committee Membership

The Steering Committee will consist of:

- the following members:
    - one member representing the Founding Member (Adani Mining Pty Ltd);
    - one member representing the administering authority for the *Nature Conservation Act 1992* (currently the Queensland Department of Environment and Science);
    - any replacement member of the above members

      (each, a Core Member), and
- if it chooses to do so, one member recommended by the administering authority for the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (currently the Commonwealth Department of the Environment and Energy);
- other members nominated by a Core Member, including where applicable:
    - one member for each other member of the Trust; and

- other members as approved unanimously by the Core Members, where doing so would be in the interest of a Funding Program

(each, an Additional Member).

A Core Member may only resign from the Steering Committee if a replacement is appointed with the unanimous approval of the other Core Members.

An Additional Member may:

- resign upon providing notice to the Core Member which nominated their appointment; or
- be removed by the Core Member which nominated their appointment.

The Steering Committee will be chaired by:

- in relation to matters which concern a Program, other than the Carmichael Conservation and Research Program, and which do not concern other Funding Programs, the representative of the member to whom that Funding Program relates; and
- in respect of all other matters, the Core Member representing the Founding Member, or by agreement of the Founding Member, another stakeholder representative.

The Steering Committee must include expertise in commissioning, assessing and reviewing proposals and reports from funded research. This may be achieved by appointing specialists to the Steering Committee, temporarily or permanently, or by engaging advisory services.

5. Duties of members of the Steering Committee

The Steering Committee must not make a decision which would cause any member of the Steering Committee to be in breach of their approval conditions.

The Steering Committee will undertake to approve, assess, manage and review the Funding Program which is to be funded from the Fund, as contemplated by the Carmichael Conservation and Research Program or by the Program of another member of the Trust, and any other funding rules, policy or guidelines designed to assist the Steering Committee with ensuring the Fund meets each members' obligations.

The Steering Committee shall direct the Trustee to make payments of redemption amounts to carry out the Funding Program.

6. Advisory services and consultation

The Steering Committee of the Fund may seek advice or consult with relevant stakeholders, such as the following:

- Queensland Coordinator-General (CG)
- local indigenous groups

- to ensure the program supports a regional approach - Natural Resource Management Groups
- the recovery teams for species relevant to Research Projects.

The Steering Committee may choose the method of engagement with those providing advisory services, either by workshop, creating a consultative group with regular meetings, workshops, independently or any other way to support the Program and Fund.

To meet the Proponent's EPBC Approval condition 18(g), the identification of priority actions for funding will be decided by the Steering Committee in consultation with the administering authority for the *Nature Conservation Act 1992* (currently the Queensland Department of Environment and Science) and members of relevant Recovery Teams.

7. Conflicts of interest

Members of the Steering Committee or those providing advisory services will be required to declare any material personal interests in a matter that relates to the Fund and must give other members of the Steering Committee notice of that interest. Members of the Steering Committee may only be present and vote on such matters with the approval of all other members of the Steering Committee.

Members of the Trust and Steering Committee Members will be subject to general confidentiality restrictions and agreements or as otherwise authorised or required by law.

8. Meetings

Frequency and format of meetings

The Steering Committee will meet a minimum of twice annually, using its best endeavours to hold the first meeting within 90 days of the date of the Trust Deed, or approval of the Program, whichever is later.

It is envisaged that the Steering Committee may meet more regularly in Year 1, such as bi-monthly, in order carry out its role under the terms of the Fund.

A meeting of the Steering Committee may be conducted by telephone or other means so long as every member attending the meeting can hear the entire proceedings.

Quorum

The quorum required to carry out a meeting of the Steering Committee will be:

- where there is no Additional Member appointed, all Core Members; and
- where there are Additional Members appointed, two Core Members, one being the chair of the Steering Committee and one Additional Member.

All decisions by the Steering Committee must be agreed to unanimously by all Core Members present, less any members who are unable to vote on a matter.

Deadlock procedures

If the Core Members of the Steering Committee are unable to come to a unanimous decision in relation to any matters raised at the Steering Committee meeting (Deadlock Matter):

- any of the Core Members of the Steering Committee may refer the Deadlock Matter for discussion between nominated executives of the Core Members and, unless all of the nominated executives of the Core Members agree otherwise, an independent third party acceptable to them (each acting reasonably) to assist them to resolve the Deadlock Matter. The costs of the independent third party will be borne by each of the Core Members;
- if, after 10 Business Days of referring a Deadlock Matter, the matter is unable to be resolved, then the chair of the Steering Committee shall make a decision in respect of the Deadlock Matter on behalf of the Steering Committee.

The dispute resolution process states that the Chair of the Steering Committee has a final decision in the case of dispute, as the Proponent holds the obligation to meet conditions and approvals requirements for the Program and Project.

9. Agenda and papers

The Secretariat of Steering Committee of the Fund will be provided by one of the Proponents, for which Programs are being delivered by the Fund. Agendas will be provided at least 1 week prior to meetings. The agenda may be supported by papers, where relevant.

10. Reporting

The Trustee of the Fund will liaise and report at least annually to the Steering Committee.