NEW HOPE GROUP

Appendix B
Koala Species Management Plan

KOALA SPECIES MANAGEMENT PLAN

NEW ACLAND MINE

Prepared for
New Acland Coal Pty Ltd

Biodiversity Assessment and Management Pty Ltd
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July 2014

BAAM
ECOLOGICAL CONSULTANTS

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Client: New Acland Coal Pty Ltd

Project Title: Koala Species Management Plan - New Acland Mine

Project Author/s: Adrian Caneris and Dr Jo Chambers

Project Summary: Document strategies and actions for the management of Koala within the New Acland Mine Stage 3 Project and surrounding landscape.

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Signed on behalf of
Biodiversity Assessment and Management Pty Ltd

Date: 1st July, 2014

Director

SPECIES MANAGEMENT PLAN – KOALA

NEW ACLAND STAGE 3 PROJECT

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Abbreviations

KSMP	Koala Species Management Plan
CoG	Coordinator General

NAC	New Acland Coal Pty Ltd
GM	General Manager
TSS	Technical Services Superintendent
EO	Environmental Officer
NHG	New Hope Group
DEHP	Queensland Department of Environment, Heritage and Protection
DERM	Queensland Department of Environment and Resource Management (now DEHP)
Koala Plan	The Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006–2016.
NC Act	*Nature Conservation Act 1992 (Qld)*
BAAM	Biodiversity Assessment and Management Pty Ltd

1.0 INTRODUCTION

This Koala Species Management Plan (KSMP) has been prepared by Biodiversity Assessment and Management (BAAM) Pty Ltd for implementation by New Acland Coal Pty Ltd (NAC) to mitigate and manage impacts on the conservation significant Koala *Phascolarctos cinereus* which is known to be present within the New Acland Coal Mine Stage 3 Project (revised Project) area.

This KSMP has been prepared to address the Coordinator General (CoG)'s additional information requirements for the revised Project's 'Additional Information for the EIS (AEIS)' and to ensure appropriate management responses to mitigate known and potential impacts on Koala and their habitats.

The CoG's additional information requirements seek targeted mitigation measures to address impacts on Koala over the life of the revised Project, and as a minimum must include:

- staff awareness training;
- rehabilitation with Koala feed trees;
- identification of fauna movement and high risk areas; and
- identification of suitable fauna movement control devices and management responses.

A review of the revised Project's draft Environmental Impact Statement (NHG 2014) and the New Acland Koala Survey (SKM 2013) presented in **Appendix 1**, together with the BAMM Ecological Consultants' knowledge of the species and their management have informed the development of this KSMP.

2.0 BACKGROUND

2.1 PROJECT LOCATION

The revised Project site is located within southeast Queensland's Darling Downs region 14 km north-northwest of Oakey, 35 km northwest of Toowoomba and 177 km west of Brisbane. The revised Project area covers a total of 1,815 ha. The Project's location is shown in **Figure 2.1**.

2.2 PROJECT BACKGROUND

NAC currently operates the New Acland Coal Mine (Mine) as an approximately 5 million tonne (product coal) per annum open cut coal mine on mining lease (ML) 50170 and ML 50216, under Environmental Authority (EA) EPML00335713. The Mine commenced operations in October 2002 and encompasses a total area of 2,278 ha. The Mine has coal reserves that will allow current mining operations to continue until approximately 2017.

NAC proposes to extend mining operations at the Mine to approximately 2029 through the implementation of the revised Project, which includes the progressive mining and rehabilitation of three new pit areas within MLA 50232 – Manning Vale East, Manning Vale West and Willeroo.

NAC submitted a draft Environmental Impact Statement (EIS) in November 2009 for the New Acland Stage 3 Coal Mine Expansion Project (the original proposal), which was declared a 'significant project' requiring an EIS by the Queensland Coordinator-General (CoG) under Part 4 of the *State Development and Public Works Organisation Act 1971* (SDPWO Act) on 18 May 2007. The original proposal involved the staged expansion of the Mine up to a capacity of 10 Mtpa. The original proposal was expected to extend coal production at the Mine until approximately 2042.

During 2012, the New Hope Group (NHG) in direct response to comments and concerns raised by the State Government and other stakeholders scaled down the original proposal to the current format of the revised Project.

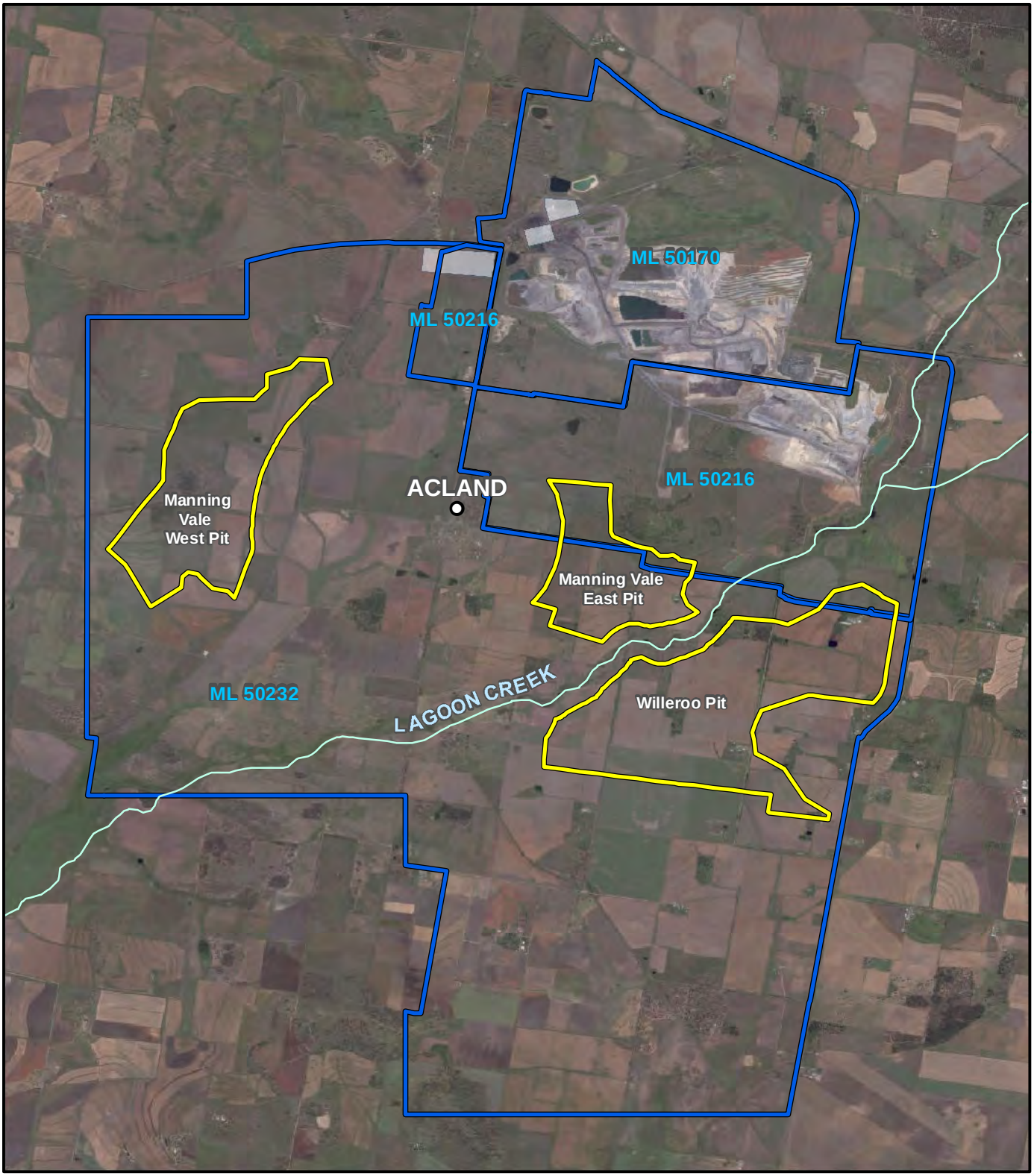
As part of the revised Project, NAC proposes to move the existing Jondaryan Rail Load-out Facility to the revised Project site. An eight-kilometre rail spur and loop will connect the new Train Load-out Facility to the south of the Manning Vale West Pit to the main southwestern rail line.

In addition, on 9 November 2012, the then Commonwealth Department of Sustainability, Environment, Water, Population and Communities (now Department of the Environment) confirmed it had accepted the revised Project as a 'project variation' under the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999*.

During late 2012 to early 2013, a new Terms of Reference (ToR) for the revised Project were developed under the SDPWO Act. The CoG released the approved ToR for the revised Project during March 2013.

During early 2014, NAC lodged a draft EIS for the revised Project with the CoG, which was subsequently approved for public consultation during January-February 2014.

As a result, NAC is currently responding to government and public submissions to the revised Project's draft EIS, which will be re-submitted to the CoG during mid-2014 as the AEIS. The KSMP will be provided in **Appendix B** of the revised Project's AEIS.



Coordinate System: GCS Australian 1984
Datum: Australian 1984
Units: Degree

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0 0.25 0.5 1 1.5 2
Kilometers

LEGEND

- Mine Tenement
- Stage 3 Pit Areas
- Waterways
- Locality

Drawn By: MG Reviewed by: LP Date: 24/06/2014

Figure:	**2.1**
Title:	Project Location and supporting information
Project:	**New Acland Mine Stage 3**
Client:	**New Acland Coal Pty Ltd**

BAAM ECOLOGICAL CONSULTANTS

2.3 KOALA PROFILE

Koala *Phascolarctos cinereus*

Status: EPBC Act: Vulnerable; NC Act: Vulnerable (SEQ Bioregion) and Special Least Concern (Culturally Significant)

Distribution: Koalas are widely distributed throughout north-east, central and south-east Queensland, extending south through New South Wales and Victoria into South Australia and Kangaroo Island.

Ecology and Habitat: Koalas have a distinct association with eucalypt woodland and forest habitat types containing suitable food trees (Hume and Esson 1993; Moore and Foley 2000; Martin *et al.* 2008), particularly those growing on alluvial or other fertile soils (Moore et al. 2004, Crowther *et al*. 2009). Koalas are not necessarily restricted to bushland or remnant areas and are known to exist and breed within farmland and the urban environment (Dique *et al.* 2004). Similarly, Koalas' movement is not confined to vegetated corridors, as they also move across cleared rural land and through suburbs (Martin *et al.* 2008).

Koalas use a variety of trees, including many non-eucalypts, for feeding and resting (Dique *et al.* 2004; Martin *et al.* 2008). However, Koalas do have distinct, localised feeding preferences throughout their range, selecting some species in preference to others (Pahl and Hume 1990). Tree species preferences by Koalas vary around Queensland as follows:

- in the Redlands of south-east Queensland, the dominant diet species are *Eucalyptus tereticornis* (Hasegawa 1995) and E. microcorys (Tun 1993);
- on North Stradbroke Island, Koalas prefer E. robusta (55% of diet), E. pilularis (13%), *E. tereticornis* (10%) and *Lophostemon confertus* (8%) (Woodward et al. 2008);
- in the Clermont district of central Queensland, Koalas prefer *E. populnea* (59% of diet), E. crebra (11%) and *E. tereticornis* (7%) (Ellis et al. 2002); and
- in the mulga lands around Charleville in south-west Queensland, Koalas prefer *E. camaldulensis* (32% of diet), *E. thozetiana* (29%), *E. coolabah* (18%) and *E. populnea* (11%) (Sullivan et al. 2003).

In northern New South Wales, Koalas at Port Stephens fed mostly on *E. robusta* (65%) and *Angophora costata* (7%) (Matthews *et al*. 2007).

Koalas are also known to favour individual trees. A variety of reasons have been postulated to explain this behaviour, including high leaf moisture content, high leaf nitrogen content (which is often related to low fibre content making leaves more palatable) and low amounts of chemical compounds produced by eucalypts to resist herbivory (Pahl and Hume 1990; Hume and Esson 1993; Moore and Foley 2000).

Individual animals, although solitary, coexist within overlapping home ranges, which contain sufficient feed trees that are visited repeatedly and often shared with other individuals (Martin *et al.* 2008). Home range sizes vary from an average home range size of 34 ha and 15 ha for males and females respectively in south-east Queensland (White 1999), to 135 ha and 101 ha for males and females respectively (range 5.4 ha to 296 ha) in central Queensland (Ellis *et al.* 2002), and 40-2,000 ha (mean 600 ha) in a low density Koala population in bushland at Eden, NSW (Jurskis *et al.* 1994).

Koala densities reported in Queensland include density estimates of 0-0.76 Koalas/ha (mean 0.16 koalas/ha) in high Koala density bushland sites in the former Pine Rivers Shire (Dique *et al.* 2003a), 0.75 Koalas/ha at Burbank in the Koala Coast (Dique *et al.* 2003a), 0.02-1.26 Koalas/ha on the Koala Coast (Dique *et al.* 2004), 0.02-0.4 Koalas/ha in central Queensland, and 0.1-2.0 Koalas/ha and 0.4

Koalas/ha in other parts of Queensland (Gordon *et al.* 1990 and White and Kunst (1990) cited in Dique *et al.* 2003a).

Breeding occurs in spring/summer when males become territorial, attacking and fighting rivals, and using loud bellows to advertise their presence (Martin *et al.* 2008). Young Koala permanently leave the female's pouch after seven months, but continue to ride on the mother's back until 12 months and the beginning of a new breeding season. After this time adolescent females may remain in the natal habitat, but males generally disperse to new territories between 1-3 years of age (Dique *et al*. 2003b; Martin *et al.* 2008).

Threats: Current threats to Koalas include habitat destruction and fragmentation, bushfire and disease (Maxwell *et al.* 1996). Populations around urban areas are also at increased risk of mortality due to dog attack and vehicle strike (Preece 2007, DERM 2009; Rhodes *et al*. 2011).

To maintain and conserve a landscape that contains a sufficient amount of habitat to sustain a viable koala population, at least 40-50% of the landscape should comprise primary and secondary Koala habitat across landscape extents of 1 km radius around where Koalas occur (McAlpine *et al.* 2007). To maintain and restore Koala habitat patches (or clusters of highly connected patches) that are large enough to sustain viable Koala populations, primary and secondary Koala habitat patches should be larger than 50-100 ha in size, unless they are part of a cluster of highly connected patches (i.e. patches separated by less than 100-200 m), in which case highly connected patches should be larger than 100 ha in total area (McAlpine *et al.* 2007).

2.4 THE PROJECT AND KOALA HABITATS

2.4.1 Existing Koala Habitat Values

Most of the original vegetation within the revised Project area and surrounding landscape has been cleared for the agriculture, grazing and mining operations. The original pre-European vegetation within these areas would have comprised woodlands and open forests of Poplar Box *Eucalyptus populnea*, Brigalow *Acacia harpophylla* and Belah *Casuarina cristata* on low lying alluvial plains and low hills on clay soils.

Pre-clear mapping indicates that a single RE, RE11.3.17 *Eucalyptus populnea* woodland with *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains dominated the revised Project area.

It is also notable that Forest Red Gum *Eucalyptus tereticornis*, a recognised primary Koala food tree, is present in low numbers within the revised Project area. It is reasonable to assume that this tree species may have occurred in higher densities prior to vegetation being cleared in the local landscape, and therefore, it is a highly desirable to increase the number of this tree species within the landscape to improve Koala habitat values.

The revised Project area holds habitats which are known to provide refuge and feeding resources for Koala. Although primarily associated with the remnant vegetation, Koala habitats are scattered across the revised Project area, and include isolated trees.

The revised Project area has clear evidence of a relatively long history of vegetation clearing and agricultural and grazing uses with only small remnants of the original vegetation now present. The prior land uses have resulted in the loss and/or degradation of the majority of the Koala habitat within the revised Project area.

In respect to Koala habitat values, the revised Project area has a relatively high level of habitat fragmentation and supports introduced predators, which result in lower habitat values due to diminished habitat and ongoing threatening processes.

Even though the majority of the revised Project footprint is located on cleared agricultural land, the associated actions will result in the clearing of some remnant vegetation. A total of 142.9 ha of remnant vegetation will be cleared, although it should be understood that not all of these areas provide habitat of value for Koala. For example, the 40.1 ha (approximate) of remnant bluegrass grassland that is to be removed has little to no relevance to Koala habitat values. However, the removal of approximately 18 ha of known Koala habitats comprising Poplar Box *Eucalyptus populnea* (REs 11.3.2 11.3.17, 11.9.10) and Gum-topped Box *Eucalyptus moluccana* woodlands/open forest (RE11.9.13) constitutes habitat loss which should be offset through restoration or revegetation of suitable Koala habitats.

It is noted that these unavoidable impacts on protected vegetation and species at both Commonwealth and State level will be mitigated through biodiversity offsets which have been detailed in a updated Biodiversity Offset Strategy, provided in **Appendix M** of the revised Project's AEIS.

2.4.2 Koala occurrence

The New Acland Koala Survey (SKM 2013) identified Koala evidence within the revised Project area and specifically within Koala transects T2, T3, T4, T5, T7,T8, T9, T11, T15 and T17 and also at Opportunistic site OB1. No Koala evidence was recorded in T10, T13, T14, T18 or OB2 (**Appendix 1,** Figure 1).

The Koala survey was conducted following significant rainfall events which were likely to have reduced the detectability of Koala evidence along the flooded Lagoon Creek.

Although Koala evidence was primarily recorded in the north-western portion of the survey area, evidence was recorded along Lagoon Creek and in the southern portions of the survey area. It is predicated that Koalas could and would occur within suitable habitats throughout the revised Project area.

There is currently insufficient data to allow an accurate estimate of the number of Koalas or population density within the local landscape, although it is well known that Koalas are relatively sparse and uncommon in the local landscape.

3.0 SIGNIFICANT IMPACT ASSESSMENT

3.1 ASSESSMENT OF IMPORTANCE

In accordance with the diagnostic criteria (DoE 2013), the revised Project area supports 'habitat critical to the survival' of Koala (**Table 3.1**). The Koala population in the revised Project area is assessed as not likely to meet the definition of an 'important population' in accordance with the Significant Impact Guidelines 1.1 (DoE 2009). The low-density population of Koala is unlikely to be a key source population for either breeding or dispersal and is not likely to be necessary for maintaining genetic diversity of the Brigalow Belt bioregion Koala population.

3.2 IMPACT ASSESSMENT

The revised Project will clear approximately 18 ha of potential Koala habitat that meets the criteria of 'habitat critical to the survival' of Koala and includes REs 11.3.2, 11.3.17, 11.9.10, 11.9.13 from Table 3 of the updated Biodiversity Offset Strategy, provided in **Appendix M** of the revised Project's AEIS.

The rehabilitation of important protected habitats commenced within the Mine's conservation zone during 2009 with the exclusion of cattle from the riparian areas of Lagoon Creek and the commencement of direct planting. NAC is committed to the restoration of a 50 metre wide buffer on both sides of Lagoon Creek within the Mine and revised Project areas. The management of the conservation zone is outlined in NAC's Conservation Zone Management Plan (CZMP) (NHG 2013a). The CZMP (NHG 2013a) will include the planting of Koala food tree species, which will greatly improve the overall habitat values of the revised Project area and will provide a net benefit to the local Koala population.

An assessment of the impacts of the revised Project on Koala in accordance with Commonwealth impact assessment guidelines (DoE 2013) is summarised in **Table 3.2**.

Table 3.1 Assessment of Koala Habitats in accordance with DoE (2013).

Attribute	Score	Inland	Score	Assessment details
Koala occurrence	+2 (high)	Evidence of one or more koalas within the last 2 years.	**2**	The New Acland Koala Survey (SKM 2013) identified evidence of Koala usage within several habitat patches and across the revised Project site.
	+1 (medium)	Evidence of one or more koalas within 5 km of the edge of the impact area within the last 10 years.		
	0 (low)	None of the above.		
Vegetation Composition*	+2 (high)	Has forest, woodland or shrubland with emerging trees with 2 or more known koala food tree species in the canopy.	**2**	The Queensland Regional Ecosystem (RE) map shows the revised Project site does supports open forest/open woodland dominated by known Koala food trees as well as minor occurrences of rainforest remnant vegetation.
	+1 (medium)	Has forest, woodland or shrubland with emerging trees with 1 or more known koala food tree species in the canopy.		
	0 (low)	None of the above.		
Habitat connectivity	+2 (high)	Area is part of a contiguous landscape ≥ 1000 ha.	**2**	Although bushland habitats are highly fragmented, Koala can readily cross cleared areas to assess food and refuge sites. It is therefore considered that the revised Project area is part of a contiguous landscape >1000 ha in area.
	+1 (medium)	Area is part of a contiguous landscape < 1000 ha but ≥500 ha.		
	0 (low)	None of the above		
Key existing threats	+2 (high)	Little or no evidence of koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.	**1**	Based on the location of the Mine and the revised Project, it is expected that the local Koala population would not encounter vehicles on a regular basis, but farm and wild dogs may pose a greater threat. Therefore, it is predicated that key existing threats would be infrequent.
	+1 (medium)	Evidence of infrequent or irregular koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for koala occurrence.		
	0 (low)	Evidence of frequent or regular koala mortality from vehicle strike or dog attack in the study area at present, or Areas with score 0 for koala occurrence and have a significant dog or vehicle threat present.		
Recovery value*	+2 (high)	Habitat is likely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1 of the draft referral guidelines (DoE 2013).	**1**	Table 1 of DoE 2013 prescribes, that for Inland areas, the interim recovery objective(s) are to: *"Protect and conserve the quality and extent of habitat refuges for the persistence of the species during droughts and periods of extreme heat, especially in riparian environments and other areas with reliable soil moisture and fertility. Maintain the quality, extent and connectivity of large areas of koala habitat surrounding habitat refuges".* Retention and restoration of riparian habitats associated with Lagoon Creek will, over time, provide important refuges for the local Koala population.
	+1 (medium)	Uncertainty exists as to whether the habitat is important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1 of the draft referral guidelines (DoE 2013).		
	0 (low)	Habitat is unlikely to be important for achieving the interim recovery objectives for the relevant context, as outlined in Table 1 of the draft referral guidelines (DoE 2013).		
Total Score			**8**	

Table 3.2 Assessment of Impact from the New Acland Stage 3 Project on Koala.

Impact assessment criterion	Impact assessment
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:	
lead to a long-term decrease in the size of an important population of the species	**No significant impact likely.** Although evidence of Koala utilisation of the revised Project area was observed during the Koala survey (SKM 2013), it appears no Koalas were sighted. The revised Project currently supports a low-density Koala population that is part of a larger low-density bushland population in contiguous habitat. This low-density population is unlikely to be recognised as an important population under the EPBC Act impact assessment guidelines. Implementation of the recommended mitigation measures, including an appropriate offsets strategy, is expected to offset the impacts of habitat clearing on this population.
reduce the area of occupancy of an important population	**No significant impact likely.** The revised Project is expected to reduce the area of occupancy of the local population by approximately 18 ha, but this population is unlikely to be recognised as an important population under the EPBC Act impact assessment guidelines. Furthermore, habitat retention and rehabilitation is expected to improve habitat quality within retained habitats.
fragment an existing important population into two or more populations	**No significant impact likely.** The revised Project will maintain Koala habitat connectivity across the landscape through the retention and rehabilitation of more valued habitats along Lagoon Creek. Therefore, revised Project is not expected to fragment the existing population.
adversely affect habitat critical to the survival of the species	**No significant impact likely.** The revised Project is expected to clear approximately 18 ha of habitat assessed as 'habitat critical to the survival' of Koalas as defined in accordance with the draft referral guidelines. However, the existing habitats consist of relatively small isolated patches or bushland, individual trees within agricultural lands, or as buffers along road reserves. Retained habitat will be rehabilitated, and over time, will provide a net benefit to the local Koala population.
disrupt the breeding cycle of an important population	**No significant impact likely.** Implementation of the KSMP developed for the revised Project site will ensure that a fauna spotter is present during vegetation clearing and no vegetation clearing will occur in an area in which a Koala is located until the Koala has relocated under its own volition. Therefore, the revised Project is not expected to disrupt the breeding cycle of the local population, a population that is unlikely to be recognised as an important population. As the clearing is occurring in stages and there is minor loss of habitat at any one time, the revegetation is expected to provide a net benefit in habitat available to the species.
modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	**No significant impact likely.** The revised Project is expected to clear approximately 18 ha of habitat assessed as 'habitat critical to the survival' of Koala. However, Koalas are present at a low population density on the revised Project site. Implementation of the recommended mitigation measures, including an appropriate offsets strategy, is expected to offset the impacts of habitat clearing, and overtime will result in a net benefit for the local Koala population. Weed management is expected to increase habitat quality of retained habitat areas, particularly habitat associated with Lagoon Creek.
result in invasive species that are harmful to the species becoming established in the species' habitat	**No significant impact likely.** The revised Project is situated in a heavily cleared agricultural area that is 'heavily invaded by introduced pest species such as Feral Cat, Wild Dog and Red Fox' (NHG 2014). The Pest and Weed Management Plan (NHG 2013b) developed for the revised Project includes strategies and actions to manage weed and pest species within the revised Project site.
introduce disease that may cause the species to decline	**No significant impact likely.** The revised Project is not expected to introduce disease that may cause Koalas to decline.
interfere substantially with the recovery of the species	**No significant impact likely.** The revised Project is expected to contribute to possible impacts on the local Koala population. However, this local population has low population density. Therefore, the relatively small number of Koalas affected is not likely to interfere substantially with the recovery of the species.

4.0 SPECIES MANAGEMENT PLAN

The KSMP prescribes the measures required for the management of Koalas across the entire revised Project area, including provision of suitable habitat and appropriate movement corridors. The KSMP comprises the following main components.

- Objectives.
- Potential impacts.
- Provision of net benefits to Koalas, including an Action Plan.
- Prevention of death or injury to Koalas, including an Action Plan.
- Performance monitoring and adaptive management, including an Action Plan.

The KSMP has been informed, in part by the results of the New Acland Koala Survey (SKM 2013). The KSMP is also designed to be consistent with NAC's CZMP (NHG 2013a).

4.1 OBJECTIVES

The key objectives of the KSMP are:

- to assist the long-term persistence of a healthy Koala population within the Acland district; and
- to ensure the Koala population is not impacted by the revised Project.

These objectives will be achieved by identifying all potential impacts and providing management strategies and actions that will provide a net benefit to the local Koala population, and prevent death or injury to resident Koalas during vegetation clearing required for construction and operation of the revised Project.

4.2 POTENTIAL IMPACTS

As described, the revised Project will result in the removal of 18 ha of Koala habitat from the Acland district. As avoidance is not possible due to the location of the coal resource and design of the current economic mine plan, impacts to the resident population of Koalas within the revised Project area and surrounds must be minimised and mitigated. Both direct and indirect impacts, short-term and long-term in duration, may apply to Koalas as a result of the operation of the revised Project.

The potential impacts from the revised Project include:

- loss and/or fragmentation of important refuge and feeding habitat;
- death or injury to resident Koalas during vegetation clearing;
- increased risk of stress and disease; and
- increased risk of death or injury as a result of:
    - vehicle strike,
    - Koalas entering active mine areas, and
    - an increase in pest animals that may prey on Koalas.

Management strategies to reduce the likelihood of these impacts causing long-term detrimental impacts to the local Acland Koala population are provided in **Sections 4.3** and **4.4**.

4.3 PROVIDE NET BENEFIT TO KOALAS

Habitat loss is cited as one of the leading causes of Koala population declines, and therefore, is a priority impact requiring direct management by NAC.

In general, NAC will be required to legally secure appropriate offsets for the significant vegetation that is necessary to be cleared by the revised Project (i.e. under both Commonwealth and State statutory obligations). Details on the vegetation requiring offsetting are outlined in NAC's updated Biodiversity Strategy (**Appendix M** of the revised Project's AEIS). This action by NAC will address the loss of significant vegetation on a bioregional scale, but will not improve the habitat for the local Koala population, because the proposed offsets for the significant tree species are unlikely to be located within the Acland district (i.e. Poplar Box *Eucalyptus populnea*, REs 11.3.2 11.3.17, 11.9.10 and Gum-topped Box *Eucalyptus moluccana*, RE11.9.13).NAC believes its current commitment to the protection and enhancement of the riparian zone 50 metres either side of Lagoon Creek within the Mine and revised Project areas will mitigate the loss of critical Koala habitat over the life of the revised Project. As explained, this conservation zone will be managed by the CZMP (NHG 2013a). The restoration of the riparian zone of Lagoon Creek should facilitate natural dispersal for Koala within the Acland district and will provide important refuge and food resources during drought conditions.

NAC's CZMP (NHG 2013a) is focused on the return of the riparian zone of Lagoon Creek to an ecosystem comprising *Eucalyptus populnea* woodland with *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains (RE 11.3.17). This goal is consistent with the Queensland Herbarium's pre-clearance vegetation mapping data for the Acland area.

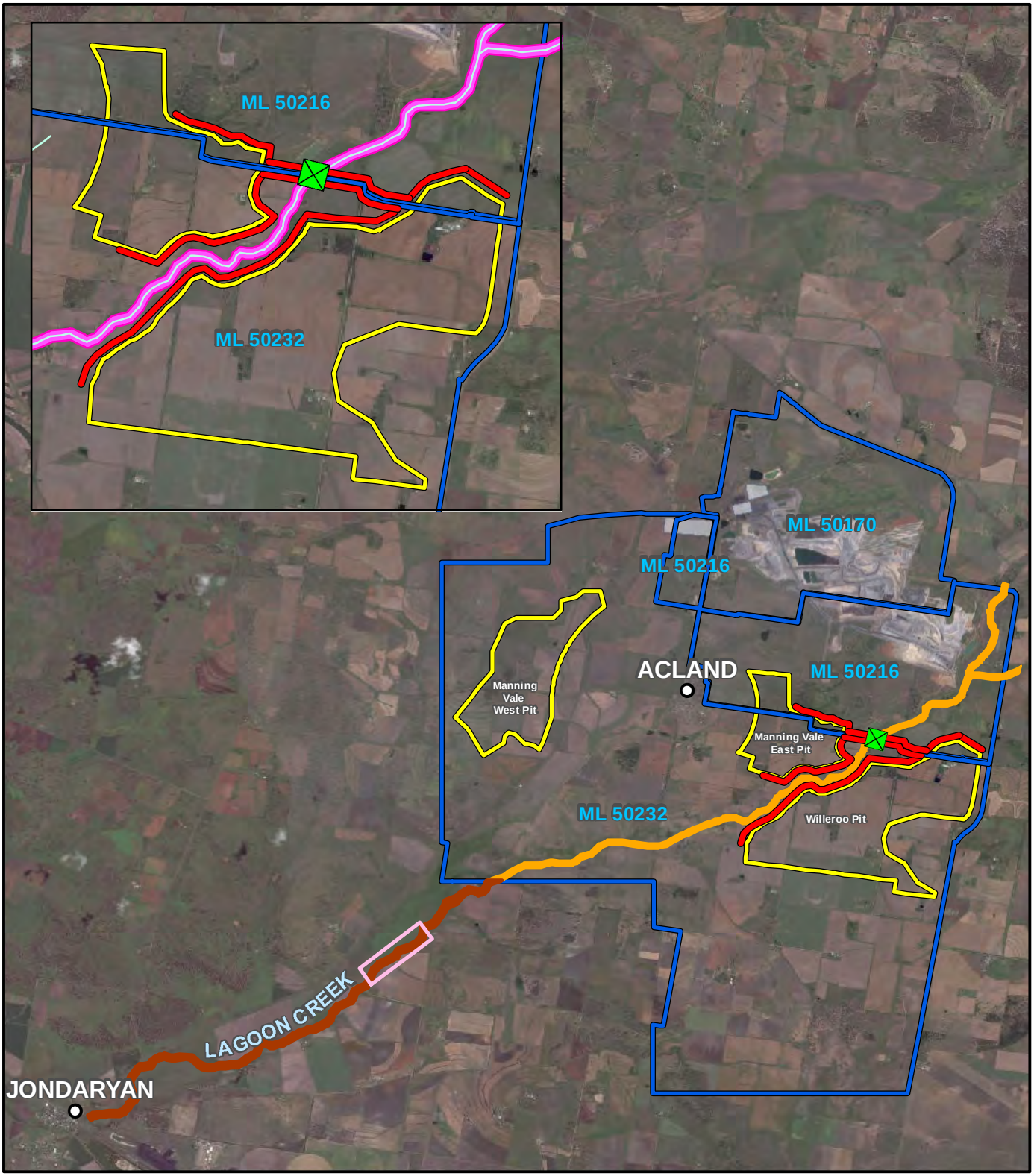
The main rehabilitation strategies proposed by the CZMP (NHG 2013a) within the riparian zone of Lagoon Creek include direct seeding and planting of areas largely devoid of remnant vegetation, facilitation of natural regeneration adjacent and within remnant vegetation, protection of remnant vegetation areas, and exclusion of grazing (except for periodic management of fire fuel loads). Performance indicators for the long term revegetation of the riparian zone of Lagoon Creek have been established from the survey of a reference site on Myall Creek, north of Acland (368858 E, 7007998 S), using the methodology prescribed by BioCondition Assessment Methodology (Eyre *et al*. 2011). This assessment methodology is recognised by the Department of Environment and Heritage Protection.

NAC will preference the use of Koala food tree species for direct seeding and planting within the conservation zone, for example, *Eucalyptus populnea, Eucalyptus tereticornis* and Mountain Coolibah *Eucalyptus orgadophila*. NAC will aim for a stem density of 200-300 stems per hectare at initial planting to achieve a minimum final density goal of 100 stems of Koala food trees per hectare. This approach incorporates a conservative degree of mortality during the first 10 years of growth.

To ensure full functionality as a safe movement corridor if infrastructure (e.g water treatment ponds, dams etc.) is to be located within the 50 metre buffer area, the extent of the buffer should be increased to accommodate the infrastructure whilst still providing a 50 meter buffer of vegetation.

The proposed Koala restoration area is shown on **Figure 4.1**, together with recommended locations for future Koala exclusion fencing.

The Action Plan to mitigate the loss of Koala habitats is provided in **Table 4.1.**



Coordinate System: GCS Australian 1984
Datum: Australian 1984
Units: Degree

1:98,512 at A4

0 0.5 1 2 3 4 5 6 Kilometers

LEGEND

- Koala exclusion fence
- Stage 3 Pit Areas
- **Koala habitat rehabilitated**
- Locality
- Stage 1
- Stage 2
- Area under negotiation with landholder
- Mine Tenement
- Koala underpass

Drawn By: MG Reviewed by: LP Date: 24/06/2014

Figure:	**4.1**
Title:	Final Landscape Layout
Project:	**New Acland Mine Stage 3**
Client:	**New Acland Coal Pty Ltd**

BAAM ECOLOGICAL CONSULTANTS

Document Location: Z:\Active BAAM Jobs\0364-001 Koala SMP\GIS\MXDs\ReportMaps\Figure 4-1 Final Landscape Layout.mxdDate: 24/06/2014 12:18:55 PM

4.4 PREVENT DEATH OR INJURY TO KOALAS

Vegetation clearing has the potential to result in injury or death to Koalas, should an animal be present at the proposed vegetation clearance site. Koalas possess the potential to accidently migrate into an operational mining area. These priority impacts require direct management by NAC.

In response to these operational threats, the revised Project's vegetation clearing and mining in the vicinity of recognised Koala habitat will be conducted in accordance with the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016* (EPA 2006), which is provided in **Appendix 2** and involves:

- the staging or limiting of vegetation clearance to what is required for safe and efficient mining operations;
- the sequential clearance of trees under the guidance of a licenced and experienced Koala Spotter;
- the exclusion of vegetation clearance between the hours of 6pm and 6am; and
- the use of exclusion fencing around dangerous or high risk operational mining area.

As standard practice, NAC will ensure that all treed areas are assessed by a licenced and experienced Koala Spotter/Handler in advance of proposed vegetation clearance activities. In the event a Koala is present, the proposed clearing of these trees will be undertaken in a sequential manner to allow the Koalas present at the time to move out of the clearance site of their own accord in preference to being moved by a licenced and experienced Koala Spotter/Handler. All mining and other activity within this area will be suspended until the Koala has moved independently out of the danger zone or is relocated to a safe area by a licenced and experienced Koala Spotter/Handler.

In addition, the clearing of Koala habitat trees in a Koala habitat area (higher risk area) must be conducted in the presence of a licenced and experienced Koala Spotter/Handler whose primary role will be to locate Koalas in the trees to be cleared. For further guidance around this process, please refer to **Appendix 2**.

All of the revised Project's operational mining areas will be progressively fenced to ensure the exclusion of Koalas during their migratory activities. NAC has identified the treed areas of Lagoon Creek within the vicinity of the Manning Vale East and Willeroo Pits as a major high risk area. NAC will develop a Standard Operating Procedure for the management of Koalas within this high risk area.

While NAC's proposed conservation zone along Lagoon Creek will require specific fencing near operational mining area. There is no current plan to fence the whole length of the conservation zone within the Mine and revised Project areas. Temporary fencing and other methods will be used to exclude stock from the conservation zone, particularly form newly planted or direct seeded areas. Importantly, the overuse of fencing along the conservation zone can detrimentally exclude migrating Koalas from potential habitat along Lagoon Creek. Therefore, NAC and the Acland Pastoral Company will actively manage the revised Project's fencing requirements for conservation purposes to ensure positive outcomes.

In the event a Koala breaches a fenced area and wanders into an operational mining area, all activities in the vicinity of the Koala will be suspended until the Koala has moved independently out of the danger zone or is relocated to a safe area by a licenced and experienced Koala Spotter/Handler. Wherever practical, the animal will be encouraged to move of its own volition. However, under certain circumstances to prevent immediate or potential threats that may cause death or harm, it will be prudent to capture and relocate the threatened animal.

NAC will ensure that only suitably qualified persons should attempt to spot or capture and contain a Koala. The licenced and experienced Koala Spotter/Handler will be required to possess appropriate equipment and cages and to immediately release all animals after capture, unless veterinary attention is required.

The licenced and experienced Koala Spotter/Handler will ensure there are no Koalas present within or immediately near any tree felling activities. NAC will ensure no Koalas are artificially relocated to expedite tree felling activities. The licenced and experienced Koala Spotter/Handler will be required to operate in compliance with the requirements of the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016* (EPA 2006), which is provided in **Appendix 2**.

The construction of the revised Project's rail infrastructure and re-alignment of the Jondryan-Muldu Road will follow the same principles for Koala management as NAC's mining operations. NAC will ensure all contractors working on these activities are contractually bound to comply with the KSMP, especially in areas where vegetation clearance is required.

Once operational, the revised Project's rail infrastructure will be permanently fenced to exclude humans and stock. On the rare occasion, a Koala may traverse the rail infrastructure. Should this occur, the KSMP's management principles will apply, that is, all rail activities in the vicinity of the Koala will be suspended until the Koala has moved independently out of the danger zone or is relocated to a safe area by a licenced and experienced Koala Spotter/Handler.

In general, NAC understands that the construction and operation phases of the revised Project may cause:

- degradation or loss of riparian habitat due to earthworks and other activities that involve vegetation clearing and alteration of channel morphology, particularly at the proposed creek crossing location;
- temporary (during construction) or permanent barriers to safe movement by Koalas; and
- a potential for increased stress or death of Koalas during construction and operation phases due to activities including vehicle movement, vegetation clearing and earthworks.

While the potential for these impacts to occur are relatively low, they are addressed by implementation of the KSMP. NAC will ensure that all staff and contractors are aware of the potential to encounter Koalas, the KSMP, and their obligations under the KSMP and any other applicable procedures, etc. developed by NAC.

The Action Plan to minimise the risk of death or injury to resident Koalas is provided in **Table 4.2**.

4.5 PERFORMANCE MONITORING AND ADAPTIVE MANAGEMENT

The KSMP's monitoring regime will evaluate the rehabilitation success within the conservation zone within the Mine and revised Project to demonstrate the status of the enhancement of Koala habitat. In addition to the rehabilitation performance criteria prescribed by the CZMP (NHG 2013a), NAC will also assess rehabilitation success against the performance criteria outlined in the "Guideline: Offset for Net Gain of Koala Habitat in South East Queensland Policy (DEHP 2012)".

As another priority, the KSMP will monitor the success of the prevention of Koala death and injury over the life of the revised Project together with the general population characteristics of the local Koala population in the vicinity of the revised Project.

The KSMP's monitoring regime will allow identification of:

- any failures in the rehabilitation process to replace and enhance suitable Koala habitat within the conservation zone (or other areas if incorporated in the future);
- changes in the local Koalas' ecological characteristics (e.g. abundance, general health and distribution); and/or
- changes in their mortality rate as a direct result of the revised Project's operation.

The KSMP's monitoring regime is essential for adaptive management responses to poor monitoring results (i.e. for the development of suitable corrective actions). NAC is committed to ensuring that the KSMP achieves its objectives. As a result, NAC will, as required, source external professional assistance to develop suitable corrective actions for significant issues identified by poor monitoring results.

To facilitate continuous improvement, NAC will review the KSMP's monitoring data on an annual basis to ensure management actions are effective and efficient. NAC may periodically amend the KSMP based on the outcome of this continuous improvement process.

The Action Plan for the KSMP's monitoring regime is outlined in **Table 4.3.**

Table 4.1 The Action Plan to mitigate the loss of Koala habitats

Overall Project Management		***Objective: Provide a net benefit to the local Koala population***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
To protect the conservation zone (Koala habitat) within the revised Project site	• Senior management is advised of the conservation zone and its protection requirements / ***Technical Services Superintendent (TSS)*** & ***Environmental Officer (EO)***. • The General Manager will ratify the conservation zone's protection and limited access status / ***General Manager (GM)***. • The boundaries of the conservation zone are delineated on all long, medium and short term mine plans for the revised Project / ***TSS***. • The boundaries of the conservation zone are clearly defined on-site (e.g. signage, fencing, etc.) / ***TSS***. • All staff, employees and contractors must complete environmental awareness training that includes the conservation zone and its protection requirements / ***TSS***, **EO** & ***training staff***. • An entry permit and protocol will be established to authorise access to the conservation zone / ***GM***, ***Pastoral Manager (PM)***, ***TSS*** & ***EO***. • Koala exclusion fencing (and signage) will be established along the boundaries of the conservation zone adjacent to operational mining areas (high risk areas). The Koala fencing will be established in a continuous and commensurate fashion to ensure it matches the progression of mining / ***GM***, ***TSS*** & ***EO***.	• Senior management is aware of the conservation zone and its protection requirements. • The General Manager has declared the status of the conservation zone. • The conservation zone is clearly delineated on all mine plans. • The conservation is clearly marked on-site to ensure that the boundaries are easily identified (e.g. signage, fencing etc.). • An authorisation system is established for access to the conservation zone. • There is no unauthorised access to / through the conservation zone. • All staff, employees and contractors are aware of the conservation zone and its protection requirements. • The Koala exclusion fencing is established and functioning efficiently.	• All new staff, employees and contractors will be provided appropriate environmental awareness training / ***EO***. • As required, existing staff, employees and contractors will be provided refresher environmental awareness training / ***EO***. • All unauthorised entry into the conservation zone will be investigated in a timely manner, and as required, corrective actions will be developed to prevent future breaches / ***GM***. • All breaches of the Koala exclusion fencing will be repaired in a timely manner and will be investigated, and as required, corrective actions will be developed to prevent future breaches / ***GM***.	• All environmental awareness training (which includes the conservation zone) must be delivered before mining commences on ML 50232 and will continue over the life of the revised Project. • The conservation zone will be established on all plans and on-site before mining commences on ML 50232 and will be maintained over the life of the revised Project. • The authorisation system for access to the conservation zone will be established before mining commences on ML 50232 and will be maintained over the life of the revised Project. • The Koala exclusion fencing (and signage) will be established before mining commences on ML 50232 and will be advanced as required to keep pace with mining activities over the life of the revised Project.

Overall Project Management		***Objective: Provide a net benefit to the local Koala population***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
To enhance the conservation zone (Koala habitat) within the revised Project site	• A baseline flora will be conducted prior to mining to establish the status within the conservation zone and the selected reference site. This survey will focus on Koala habitat / ***EO***. • A five year rehabilitation action plan will be developed for the conservation zone that delineates a program for direct seeding and planting of areas largely devoid of remnant vegetation and facilitates natural regeneration adjacent and within remnant vegetation (i.e. using the baseline data). The rehabilitation plan will focus on the long term establishment of Koala habitat and address the requirements of the CZMP (NHG 2013a). The strategic linking of remnant vegetation (core areas) will form part of the rehabilitation strategy / ***TSS*** & ***EO***. • The five year rehabilitation plan will be incorporated into the Mine's operational budget and implemented as specified (which will involves the delivery of the defined rehabilitation activities on an annual basis with consideration of seasonal and climatic conditions) / ***TSS*** & ***EO***. • A weed and pest management program will be established within the conservation zone and will be consistent with NAC's PWMP (NHG 2013b) / ***PM*** & ***EO***.	• The baseline flora survey has been completed, including the collection of Koala habitat data. • The five year rehabilitation action plan is focused on the recovery of Koala habitat. • The five year rehabilitation action plan is completed and incorporated into the Mine's budget). • Rehabilitation activities have commenced within the conservation zone with a focus on enhancing Koala habitat. • Weed and pest management activities have commenced within the conservation zone.	• The failure to complete any of the rehabilitation or weed and pest management tasks will be investigated and the necessary corrective actions will be implemented to rectify any failure. (Note: Planting activities may be delayed because of climatic conditions (e.g. drought).) / ***TSS*** & ***EO***.	• Rehabilitation activities will be conducted on an annual/bi-annual basis depending on seasonal and/or climatic conditions. In general, planting/seeding activities are normally conducted late Spring/early Summer or late Summer/early Autumn depending on soil moisture conditions, pending rainfall and temperature conditions. Rehabilitation activities will be ongoing over the life of the revised Project (i.e. until the conservation zone is fully restored). • Weed and pest management activities will be guided by bi-annual monitoring results (see **Table 4-3**), external complaints or general observations by environmental staff and the Pastoral Manager.

Table 4.2 The Action Plan to prevent death and or injury to Koalas

Overall Project Management		***Aim: Undertake Vegetation clearing and road/rail construction in a manner that does not cause death or injury to Koala.***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
To minimise the risk of death or injury to Koala during operation of the revised Project	• A 'Standard Operation Procedure' will be developed and implemented for vegetation clearance activities within the revised Project site. As a minimum, it will ensure that: - all vegetation clearance on-site is authorised and is specified as part of the mine planning process (i.e. it is operationally required); - all fauna inspections are conducted immediately prior to clearance, - a licenced and experienced Koala Spotter/Handler is employed for all inspections, - all clearance is staged (i.e. no more than 50% of a patch that is ≤6 ha cleared in any one day and allowing at least 12 hours during which no trees are cleared (refer to **Appendix 2**), - all clearance areas are clearly defined (e.g. temporary fencing, signage, etc.), and - a protocol is in-place for the removal of fauna identified within the clearance area (i.e. either naturally or by a licenced and experienced Koala Handler) / ***GM***, ***TSS*** & ***EO***. • As stated in **Table 4-1**, Koala exclusion fencing (and signage) will be installed progressively to prevent Koalas from accessing identified high risk areas, such as the Manning Vale	• No death or injuries to Koalas have occurred as a result of mining activities (including vegetation clearance). • The 'Standard Operation Procedure' for vegetation clearance is implemented and functioning effectively on-site. • No unauthorised vegetation clearance has occurred. • The Koala exclusion fencing (and signage) is installed and functioning effectively around high risk areas. • Evidence that a licenced and experienced Koala Spotter/Handler has been employed for vegetation clearance activities is available and that their contact details are easily accessible on-site for emergency relocation tasks. • The 'operation protocol' to manage Koalas that accidently access high risk and other areas is implemented and functioning effectively on-site. • Evidence that the integrity of the Koala exclusion	• All Koala deaths or injuries will be investigated, reported to the Regulatory Authorities, and as required, corrective actions will be developed to prevent future Koala deaths or injuries. • All failures of the 'Standard Operation Procedure' for vegetation clearance will be investigated, and as required, corrective actions will be developed to prevent future failures / ***GM***. • As stated in **Table 4-1**, all failures of the Koala exclusion fencing (and signage) will be repaired in a timely manner and will be investigated, and as required, corrective actions will be developed to prevent future breaches / ***GM***. • All failures of the 'operation protocol' to manage Koalas that accidently access high risk and other areas will be investigated, and as required, corrective actions will be developed to prevent future failures / ***GM***.	• The 'Standard Operation Procedure' for vegetation clearance will be established before mining commences on ML 50232 and will be maintained over the life of the revised Project. • The 'operation protocol' to manage Koalas that accidently access high risk and other areas will be established before mining commences on ML 50232 and will be maintained over the life of the revised Project. • As stated in **Table 4-1**, the Koala exclusion fencing (and signage) will be established before mining commences on ML 50232 and will be advanced as required to keep pace with mining activities over the life of the revised Project.

Overall Project Management		***Aim: Undertake Vegetation clearing and road/rail construction in a manner that does not cause death or injury to Koala.***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
	East and Willeroo Pit areas adjacent to Lagoon Creek. NAC will ensure the detailed design of Koala proof fencing is undertaken to choreograph Koala movement generally in accordance with **Figure 4.1** / ***GM***, ***TSS*** & ***EO***. • An 'operation protocol' is developed and implemented to manage Koalas that accidently access high risk and other areas, which suspends all activities in the vicinity of the Koala until the Koala has moved independently out of the danger zone or is relocated to a safe area by a licenced and experienced Koala Spotter/Handler. (Wherever practical, the animal will be encouraged to move of its own volition.) The 'operational protocol' will also apply to the operation of the revised Project's rail spur and loop / ***GM***, ***TSS*** & ***EO***. • The integrity of the Koala exclusion fencing (and signage) will be periodically inspected / ***EO***.	fencing (and signage) has been periodically inspected is available. • No Koalas have entered high risk areas on-site. • No deaths, injuries or near-misses have occurred during construction and operation of the revised Project's rail spur and loop or the construction of the Jondaryan-Muldu Road re-alignment.	• All incidents of unauthorised vegetation clearance will be investigated, and as required, corrective actions will be developed to prevent future incidents / ***GM***. • All incidents of Koalas entering high risk areas will be investigated, and as required, corrective actions will be developed to prevent future incidents / ***GM***.	

Table 4.3. The Action Plan for the monitoring regime for Koala habitats and Koala population

Overall Project Management		***Aims: Early detection of success/failures in rehabilitation activities; Early detection in any notable changes in health, distribution or abundance of local Koala population.***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
To establish the success of the KSMP in relation to enhancing Koala habitat over time and preventing Koala deaths or injuries during operation of the revised Project	• A rehabilitation monitoring program will be established as defined by the CZMP (NHG 2103a) and will assess the specified performance criteria and the performance criteria outlined in Table 1 of the "Guideline: Offset for Net Gain of Koala Habitat in South East Queensland Policy (DEHP 2012)" / ***EO***. • An annual summary report of the rehabilitation monitoring program for the conservation zone/Koala habitat will be completed / ***EO***. • A Koala survey will be conducted to assess the progress of the restoration of Koala habitat and the status of the Koala population within the vicinity of the revised Project / ***EO***. • An annual report will be completed on the Koala survey and general Koala management / ***EO***. • A register of Koala management actions (e.g. sightings, actions taken incidents – near misses, injuries and deaths, and corrective actions) will be implemented and maintained / ***EO***.	<u>General</u> • Rehabilitation monitoring activities were undertaken as specified within the conservation zone with a focus on enhancing Koala habitat. • Current rehabilitation data is available as specified. • Progressive rehabilitation success is scientifically demonstrated, including the restoration of Koala habitat. • The Koala survey activities were conducted as specified. • Current Koala survey data is available as specified. • The Koala survey data demonstrates that the revised Project is not adversely impacting on the local Koala population. • All associated reporting requirements have been completed and are available – annual monitoring and annual Koala reports. • A functioning Koala management register is available and up-to-date. • Evidence is available that weed and pest management activities have been conducted as specified. <u>Rehabilitation Indicators</u> • Guideline: Offset for Net Gain of Koala Habitat in South East	• The failure to complete any of the monitoring and/or reporting tasks as specified will be investigated and the necessary corrective actions will be implemented to rectify the failure / ***TSS*** & ***EO***. • Rehabilitation monitoring data will be used to confirm the ongoing rehabilitation performance and guide future rehabilitation activities, particularly within areas of poor natural recruitment and/or poor establishment performance (seeding and planting activities) / ***EO***. • Rehabilitation monitoring data will be used to confirm the status of the restoration of Koala habitat) and guide future rehabilitation activities, particularly in areas of poor performance / ***EO***. • All adverse impacts and/or threatening processes identified by the Koala survey data or management actions will be investigated and the necessary corrective	<u>General</u> • The Koala register will be established prior to mining commencing on ML 50232 and will be maintained over the life of the revised Project. <u>Rehabilitation</u> • Natural regeneration areas will be inspected at approximately six monthly intervals, to determine the extent of weed invasion and natural recruitment, and to assess the requirement for further intervention or management. This monitoring activity will be maintained over the life of the revised Project. • Revegetation (active seeding/planting) areas will be visually monitored monthly for the first six months (or until the plants are self-sufficient), then annually thereafter until rehabilitation targets are reached for the first 10 years. The qualitative visual monitoring will include

Overall Project Management		***Aims: Early detection of success/failures in rehabilitation activities; Early detection in any notable changes in health, distribution or abundance of local Koala population.***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
		Queensland Policy (DEHP 2012) performance criteria: - >85% survival rate of planted stock. - Growth of >0.5 m by Year 1 and 4 m by Year 4. - Natural recruitment of local native species is occurring. - Increased colonisation and use by Koalas. - Primary treatment of all weeds by the Year 3. - 95% of invasive weed removed from the site. - Sustained reduction of weed spp. to a level that ensures natural recruitment of native species is not excluded or suppressed. - No fruiting of weeds after primary treatment. • CZMP (NHG 2103a)'s performance criteria: - Recruitment of woody perennial species – 100% of overstorey species present as regeneration – after 10 years, 3 species present. - Native plant species richness – 35% of benchmark species – after 10years, 6 species present. - Tree canopy cover (%) – 30% of benchmark canopy cover – after 10 years, 10.5%. - Tree canopy height – 25% of canopy height – after 10 years, 5 metres. - Shrub layer cover (%) – 30% of	actions will be implemented to mitigate the identified adverse impacts and/or threatening processes / ***TSS*** & ***EO***.	the following: presence of active rill/gully erosion and weed species, general assessment of seedling establishment, and any general failure of rehabilitation works. This monitoring activity will be maintained over the life of the revised Project. • Reference sites and revegetation areas will be quantitatively assessed (including species composition), every 3 years after establishment of the reference sites. This monitoring activity will be maintained over the life of the revised Project. Weeds & Pests • In relation to weeds and pests, a bi-annual monitoring program will be undertaken to determine the current presence of pest and weed species and their abundance within the Mine and revised Project areas. Any significant findings, such as new pest or weeds species, new

Overall Project Management		***Aims: Early detection of success/failures in rehabilitation activities; Early detection in any notable changes in health, distribution or abundance of local Koala population.***		
Performance Goal	**Actions / Responsible Officer(s)**	**Performance Indicators**	**Corrective Actions / Responsible Officer(s)**	**Timing / Frequency**
		benchmark shrub cover – after 10 years, 3%. - Native perennial grass cover (%) – 40% of benchmark perennial grass cover – after 10 years, 26%. - Native perennial forb and non-grass cover (%) – 50% of benchmark perennial forb cover – after 10 years, 2.5%. - Large trees – 50% of benchmark number of large trees (comprised of species which will eventually become large trees) – after 10 years, minimum of 75-100 stems per ha. Koala Survey Indicators • Koala population status assessment criteria: - Estimated Koala numbers. - Evidence of breeding activity. - Signs of disease. - Records of mortality and injury. - Local distribution. - Amount and quality of available Koala habitat. - Changes in habitat utilisation.		outbreaks or any actions resulting from incidents, from the annual monitoring will be incorporated into an annual review of the PWMP. Pest and weed management will continue over the life of the revised Project.

5.0 GENERAL ENVIRONMENTAL MANAGEMENT

This section outlines general environmental management matters associated with the safe delivery and operation of the KSMP.

5.1 GENERAL RESPONSIBILITIES

The roles and responsibilities of NAC's General Manager or GM are:

- to authorise the safe implementation and operation of the KSMP on-site;
- to comply with the requirements of the KSMP and ensure adequate resources are available for its safe and effective implementation and operation (e.g. time, budget, people and external professional advice);
- to delegate the responsibility for the implementation and operation of the KSMP to the appropriate Officers on-site;
- to ensure all NAC employees are aware of the KSMP and the importance of its safe and efficient operation on-site;
- to ensure the Department of Environment and Heritage Protection and/or the Commonwealth Department of Environment are advised of any amendments to the KSMP;
- to ensure an appropriate investigation and corrective action process is functioning for all Koala incidents, management action failures or other related significant matters (i.e. to minimise the risk of reoccurrence);
- to ensure compliance with all associated statutory requirements; and
- to ensure the KSMP is reviewed annually for continuous improvement purposes.

The roles and responsibilities of NAC's Technical Services Superintendent or TSS are:

- to support the GM in the safe and effective implementation and operation of the KSMP;
- to comply with the requirements of the KSMP and ensure adequate resources are defined on an annual basis for its safe and effective implementation and operation (e.g. time, budget, people and external professional advice);
- to ensure the delivery of the KSMP's Action Plans on an annual basis;
- to ensure the delivery of the KSMP's environmental and mine planning requirements, particularly in relation to the incorporation of Koala management into the mine planning process;
- to facilitate the process of advice to the Department of Environment and Heritage Protection and/or the Commonwealth Department of Environment about any amendments to the KSMP (i.e. via the GM);
- to manage the delivery of an appropriate investigation and corrective action process for all Koala incidents, management action failures or other related significant matters (i.e. to minimise the risk of reoccurrence);
- to ensure compliance with all associated statutory requirements;
- to facilitate the periodic audit of the KSMP for compliance purposes; and
- to facilitate the KSMP's annual review process for continuous improvement purposes.

The roles and responsibilities of NAC's Environmental Officer or EO are:

- to support the GM and TSS in the safe and effective implementation and operation of the KSMP;
- to ensure the delivery of the KSMP's Action Plans on a day-to-day basis;

- to ensure the delivery of the KSMP's environmental requirements, particularly in relation to rehabilitation, monitoring, inspections, auditing and review processes, weed and pest management, and awareness training;
- to support the process of advice to the Department of Environment and Heritage Protection and/or the Commonwealth Department of Environment about any amendments to the KSMP (i.e. via the TSS and GM)
- to manage the delivery of an appropriate investigation and corrective action process for all Koala incidents, management action failures or other related significant matters (i.e. to minimise the risk of reoccurrence);
- to engage as required, the services of suitably qualified professional for Koala spotting/handling, rehabilitation assessment, monitoring, monitoring data evaluation, incident investigation and corrective action development, and review of the KSMP;
- to ensure compliance with all associated statutory requirements;
- to conduct periodic audits of the KSMP for compliance purposes; and
- to conduct the KSMP's annual review process for continuous improvement purposes.

5.2 FAUNA SPOTTER/CATCHER

An experienced licenced Koala Spotter/Handler will be engaged as required by NAC to conduct pre-clearance surveys of areas of vegetation proposed to be cleared.

The Koala Spotter/Handler will provide a brief report of all clearance or animal relocation works undertaken for NAC to assist monitoring and reporting, ecological evaluation and continuous improvement.

5.3 STAKEHOLDER ENGAGEMENT

NAC has provided the KSMP as **Appendix B** of the revised Project's AEIS to address the CoG's additional information requirements for the revised Project's. In the future, NAC will provide copies of the KSMP or any associated reports to the general public on a formal request basis.

The Department of Environment and Heritage Protection and the Commonwealth Department of Environment will be advised of all significant matters arising out of operation of the KSMP and all amendments to the KSMP. NAC will also comply with all statutory obligations if applied to the management of Koalas in the future.

5.4 CONTINUOUS IMPROVEMENT

NAC will periodically audit the operation of the KSMP to assess the status of management compliance and to identify potential areas for improvement. These audits will be conducted internally on an annual basis and every three years by a qualified third party professional. The KSMP may be amended as part of this management compliance and improvement process.

NAC will review the operation of the KSMP to ensure it is functioning effectively on-site and to identify opportunities for improvement. The first review will occur after one year of operation of the KSMP and then every year following the third party audit.

6.0 REFERENCES

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APPENDIX 1
New Acland Koala Survey Report (SKM)

New Acland Koala Survey

QE06644 | 23 April 2013

SINCLAIR KNIGHT MERZ
SKM

New Acland Koala Survey

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1. Introduction

1.1 Survey purpose and scope

The purpose of the Koala (*Phascolarctos cinereus*) survey summarised in this report is to further inform the Terrestrial Fauna and MNES chapters of the New Acland Coal Mine Supplementary Environmental Impact Statement (SEIS). Koala was listed as a Vulnerable species under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) after the EIS had been finalised.

The scope of the survey described in this report is to satisfy the information requirements of Department of Sustainability, Environment, Water Population and Communities (DSEWPaC) with respect to undertaking an assessment of the significance of impacts of the Project on Koala.

1.2 Koala ecology

The Koala is distributed patchily across a wide variety of eucalypt woodland and forest communities throughout eastern Australia (Dique *et al.,* 2004; EPA 2006). The highest population densities occur in south-east Queensland, with lower densities occurring throughout much of the remainder of the state.

1.2.1 Habitat requirements

Koalas are found in vegetation communities dominated by eucalypts. Koalas are primarily arboreal in habit, spending the vast majority of their time in the canopy of large eucalypts or other trees. Koalas choose habitat based on the suitability of food trees and population densities of Koalas tend to reflect quality of habitat (Martin *et al*., 2008). The area of the home range of individual Koalas is determined by the quality of food trees in an area of habitat (Martin *et al*., 2008). In good quality habitat, home ranges can be one to two hectares, while in less productive and arid areas home ranges can be 100 hectares (Martin *et al*., 2008).

Koalas are known to move from one area or tree to another by coming to the ground. This includes crossing paddocks and roads. They are able to use fragmented habitats as well as highly modified environments such as grazed, disturbed or thinned forest and regrowth areas. However, research has shown that Koalas prefer larger, mature trees (Dique *et al*., 2004).

1.2.2 Diet

Koalas are specialised leaf-eaters, restricted mainly to *Eucalyptus* species and some related genera including *Corymbia, Angophora* and *Lophostemon*. However, Koalas may supplement their diet with other species including those from the genera *Melaleuca* and *Leptospermum*. They eat approximately 400 grams of leaves per day. *Eucalyptus* leaves are a poor quality food source which accounts for the Koala's need to spend up to 20 hours a day sleeping, as the Koalas receive little nutritional value from the leaves (Martin *et al*., 2008). Diet is thought to be a major determinant of habitat selection (Dique *et al*., 2004).

1.2.3 Breeding

The breeding season for Koalas is between September and April, with the birth of young occurring from October to May (Krockenberger *et al*., 2012). Female Koalas first breed at two years of age and continue to breed, normally every year, until 10-12 years of age. Females commonly give birth to a single offspring with twins being extremely rare. The offspring remains in the mother's pouch for six to eight months and continues to depend on its mother until approximately 12 months of age. Once the juvenile Koala has left the pouch they ride on the mother's back until fully weaned.

1.3 Threats to Koala

The main threats to Koala include loss and fragmentation of habitat, vehicle strike and predation by dogs (DSEWPaC, 2012a). A recovery plan for the Koala will be developed covering all populations across Australia in 2014, until which point the *National Koala Conservation and Management Strategy* (DSEWPaC, 2009) outlines the conservation strategy for the species. Koala was listed as Vulnerable in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), effective 2 May 2012. The *Interim koala referral advice for*

proponents (DSEWPaC, 2012b) contains preliminary advice from DSEWPaC on whether actions affecting Koala need to be referred to the Commonwealth while official EPBC Act referral guidelines are developed. At the Queensland state level, the Department of Environment and Heritage Protection (DEHP) have released the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016* (EPA, 2006) which contains management strategies that are supported by legislation.

2. Methodology

Methods for the Koala survey comprised a desktop review of background information and a five-day field survey.

2.1 Desktop review

The desktop review involved the collation and review of mapping and previous ecological studies relevant to the project. The information that was reviewed was:

- the New Acland EIS;
- Queensland Department of Environment and Heritage Protection (DEHP) Regional Ecosystem (RE) Version 6.1 and Regrowth Vegetation Version 2.1 mapping; and
- aerial photography of the proposed mine lease boundaries.

The EIS included results of relevant database searches.

The desktop review also identified the locations of Koala observations recorded in the EIS (i.e. Lagoon Creek) and the Regional Ecosystems (REs) likely to provide food trees and habitat for Koalas.

Koala food trees are defined as any tree from the genera *Angophora, Corymbia, Eucalyptus, Lophostemon and Melaleuca,* as defined in Annex 2 of the Nature Conservation (Koala) Conservation Plan 2006 (EPA 2006). Koala habitat is defined in EPA (2006) as:

a) a woodland where Koalas currently live; or

b) a partially or completely cleared area that is used by Koalas to cross from one woodland where Koalas currently live to another woodland where Koalas currently live; or

c) a woodland where Koalas do not currently live if the woodland:

   (i) primarily consists of Koala habitat trees; and

   (ii) is reasonably suitable to sustain Koalas.

This definition of Koala food trees was used to identify vegetation communities most likely to contain Koalas or evidence of Koalas (scats, scratches) to inform the selection of field survey sites and enable a targeted survey approach.

2.2 Field survey

Two SKM ecologists conducted a targeted Koala survey from 4-8 March 2013. Koala survey methods included habitat assessments (Jurskis, 2001) and the Spot Assessment Technique (SAT) (Philips and Callaghan, 2011), which are the preferred survey methods proposed in DSEWPaC, 2012b.

2.2.1 Habitat assessment

Habitat assessments were conducted to assess whether habitat critical to the survival of Koalas occurs within the mine lease boundary. Attributes recorded at each site included:

- canopy tree species composition;
- percentage canopy cover of each canopy species;
- vegetative ground cover (percent of the ground area);
- leaf litter cover (percent of the ground area);
- bare ground (percent of the ground area);
- distance to water (m); and

- presence/absence of evidence of dogs.

The field survey was conducted under the following permits:

- Animal Ethics Approval: CA 2012/11/643, expiry date 31 December 2015; and
- Scientific Purposes Permit: WISP10848512, expiry date 28 February 2017.

2.2.2 Spot Assessment Technique

The Spot Assessment Technique (SAT) was used to determine Koala activity and utilisation. The SAT method was completed in accordance with Philips and Callaghan (2011) and involved the following steps:

1. Locate and uniquely mark with flagging tape a centre tree and then the 29 nearest Koala food trees to the centre tree; and
2. Undertake a search for Koala faecal pellets beneath each of the 30 marked trees based on a cursory inspection of the undisturbed ground surface within a distance of one metre around the base of each tree, followed (if no faecal pellets are initially detected) by a two minute inspection involving disturbance of the leaf litter and ground cover within the prescribed search area. The search is concluded once a single faecal pellet has been detected or when the maximum two minute search time has expired, whichever happens first. Where the location of faecal pellets falls within overlapping search areas due to two or more trees growing in close proximity to each other, both should be scored for pellet(s).

2.2.3 Site selection

The desktop review identified seven REs that met the criteria of containing Koala food trees and/or providing habitat for Koalas due to the presence of Koala food trees in the RE description. These REs are listed in **Table 2.1**. Where possible, for each of these seven REs, two survey sites were selected within geographically separated polygons to spread the distribution of sites across the Stage 3 mine lease area.

Table 2.1 : Regional ecosystems identified as containing Koala food trees

Regional Ecosystem	Short Description
11.3.1	*Acacia harpophylla* and/or *Casuarina cristata* open forest on alluvial plains
11.3.2	*Eucalyptus populnea* woodland on alluvial plains
11.3.17	*Eucalyptus populnea* woodland with *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains
11.3.21	*Dichanthium sericeum* and/or Astrebla spp. grassland on alluvial plains. Cracking clay soils
11.8.3	Semi-evergreen vine thicket on Cainozoic igneous rocks. Steep hillsides
11.8.5	*Eucalyptus orgadophila* open woodland on Cainozoic igneous rocks
11.9.10	*Acacia harpophylla*, *Eucalyptus populnea* open forest on fine-grained sedimentary rocks

2.2.4 Limitations

The survey was conducted after heavy rainfall in the catchment area. This restricted access to patches of vegetation accessible by road or safe walking distance

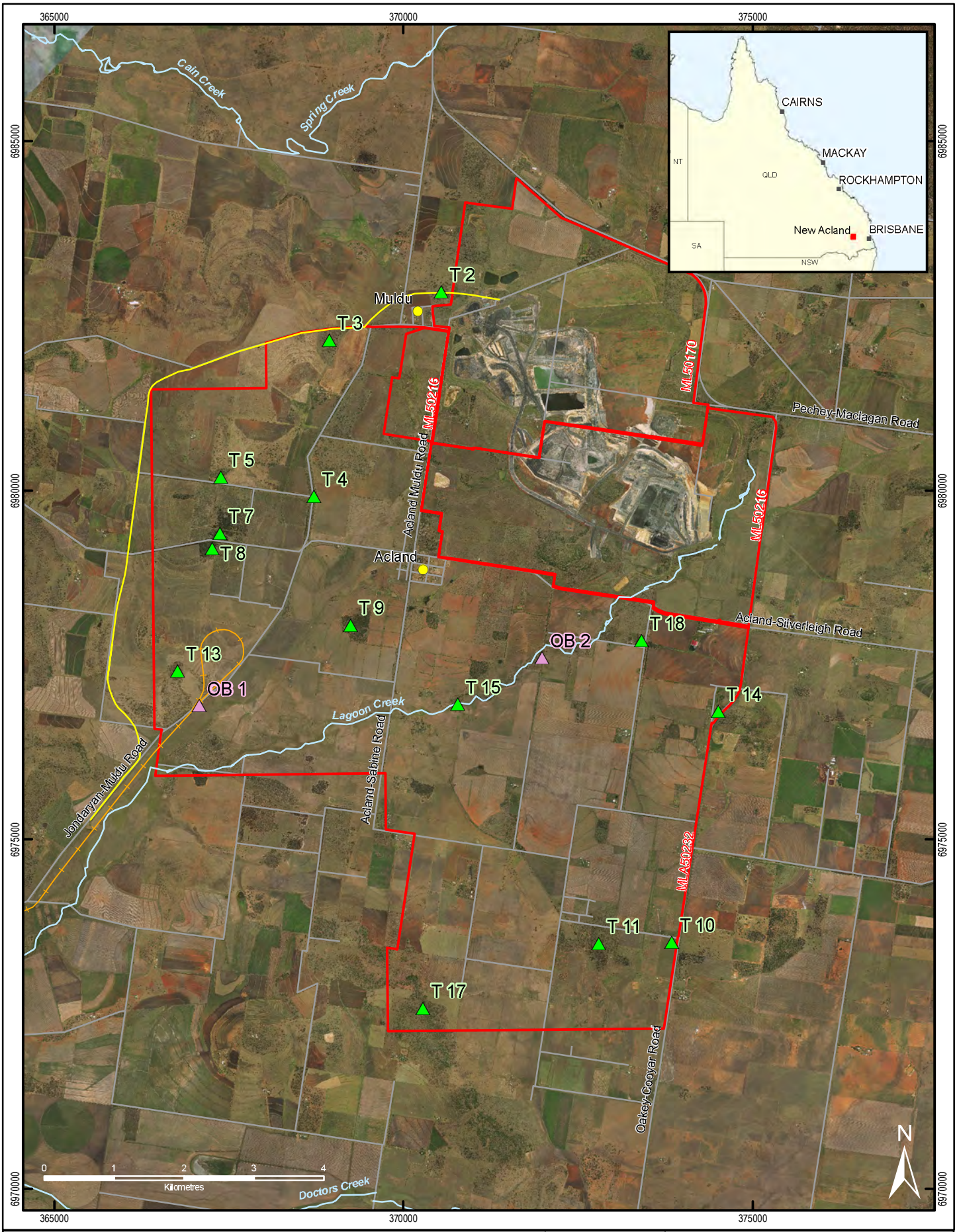
3. Koala survey results

A total of 16 sites were surveyed for the presence of Koalas. These sites are shown in **Figure 1** and the Koala survey results are summarised in Error! Reference source not found.

SAT scores ranged from 0 to 63%. T14 was not surveyed due to the highly degraded nature of the vegetation. This vegetation community is mapped as remnant semi-evergreen vine thicket however the field survey identified that the vegetation has been cleared and is now more consistent with regrowth vegetation. No Eucalypt trees were identified so a Koala SAT was not conducted.

All evidence of Koalas was located in the western section of the mine lease. The location of Koala activity is shown in **Figure 1**. Sites showing evidence of Koala usage were in close proximity to each other with the exception of T15. T15 is located on Lagoon Creek and one week prior to this survey being conducted, Lagoon Creek had experienced high rainfall and flooding. No scats were observed at T15 however Koala scratches were observed on 56% (n=17) of the 30 trees. Sites with medium to high SAT scores are generally dominated by *Eucalyptus populnea* with a total canopy cover of 35% or greater.

Sites surveyed displayed variable canopy cover of Koala food trees despite the targeted survey sampling methodology. Habitat conditions varied between sites although the majority of sites were generally in poor condition with evidence of cattle grazing, edge effects, weed invasion and evidence of feral animals.



LEGEND

Survey locations

- Koala survey sites
- Opportunity sites
- Towns and Localities
- Rail Spur
- Roads
- Creeks
- Mining Tenements

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Figure 1 : Koala Survey sites

Scale 1:71,655 on A4

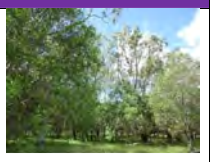
Projection: Australian Geodetic Datum – Zone 56 (AGD84)

Path: I:\QENV2\Projects\QE08644\SpatialWorkInProgress\01_Spatial\130424_SBayly_KoalaSites\130326_NewHope_Koala_Description.mxd

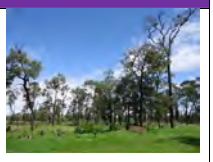
Produced: 24/04/2013

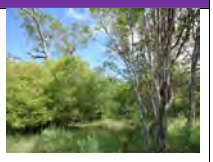
Table 3.1 : Koala survey sites

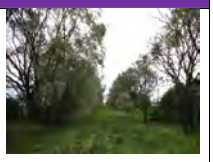
Site	RE	Vegetation community description	Canopy tree species	Total canopy cover (%)	Distance (m) to surface water	Evidence of scratches	Number of trees with Koala scats beneath (out of 30)	SAT score (%)	Photo
T2	11.8.5	*Eucalyptus orgadophila* open woodland	*Eucalyptus populnea* *Casuarina cristata* *Acacia harpophylla* *Eucalyptus orgadophila*	5 3 2 15	>200m	Yes	9	30	
T3	11.8.5	*Eucalyptus orgadophila* woodland weedy understorey including thickets of *Lycium ferocissimum* common throughout	*Eucalyptus orgadophila*	25	10	Yes	0	0	
T4	11.3.2	*Eucalyptus populnea* woodland near a major road.	*Eucalyptus populnea*	25	>200m	Yes	12	40	

Site	RE	Vegetation community description	Canopy tree species	Total canopy cover (%)	Distance (m) to surface water	Evidence of scratches	Number of trees with Koala scats beneath (out of 30)	SAT score (%)	Photo
T5	11.8.5/ 11.3.21	*Eucalyptus orgadophila* open woodland	*Eucalyptus orgadophila* *Corymbia tessellaris*	30 5	200m to ephemeral creek	Yes	4	13	
T7	11.9.10	*Eucalyptus populnea* open forest	*Eucalyptus populnea* *Allocasuarina luehmannii* *Casuarina cristata*	10 20 15	>200m	Yes	16	53	
T8	11.9.10	*Eucalyptus populnea* open forest	*Eucalyptus populnea* *Eucalyptus orgadophila* *Allocasuarina luehmannii*	15 15 15	>200m	Yes	17	56	

Site	RE	Vegetation community description	Canopy tree species	Total canopy cover (%)	Distance (m) to surface water	Evidence of scratches	Number of trees with Koala scats beneath (out of 30)	SAT score (%)	Photo
T9	11.3.2	*Eucalyptus populnea* woodland	*Eucalyptus populnea* *Casuarina cristata*	5 30	Localised, ephemeral wet depression	Yes	19	63	
T10	11.3.21	*Dichanthium sericeum* grassland with isolated scattered trees	*Eucalyptus populnea*	5	>200m	No	0	0	
T11	11.3.2/ 11.3.17	*Eucalyptus populnea* woodland	*Eucalyptus populnea* *Allocasuarina luehmannii*	20 5	10	Yes	7	23	

Site	RE	Vegetation community description	Canopy tree species	Total canopy cover (%)	Distance (m) to surface water	Evidence of scratches	Number of trees with Koala scats beneath (out of 30)	SAT score (%)	Photo
T13	11.3.1	*Acacia harpophylla* open forest	*Acacia harpophylla*	25	100m	No	0	0	
T14	11.8.3	Vegetation recently cleared with weedy regrowth noted throughout. No emergent Eucalyptus.	*Geijera parvifolia*	10	>200m	No	N/A	N/A	
T15	11.3.17	*Eucalyptus populnea* woodland, it is noted that the site has been flooded recently.	*Eucalyptus populnea* *Acacia harpophylla*	15 15	0	Yes	0	0	

Site	RE	Vegetation community description	Canopy tree species	Total canopy cover (%)	Distance (m) to surface water	Evidence of scratches	Number of trees with Koala scats beneath (out of 30)	SAT score (%)	Photo
T17	11.8.5	Some large *Eucalyptus orgadophila* with thick mid – storey in places	*Eucalyptus orgadophila* *Corymbia tessellaris*	23 2	>200m	Yes	1	3	
T18	11.3.1	*Acacia harpophylla* open forest	*Acacia harpophylla*	35	0	No	0	0	
OP 1	11.3.2	*Eucalyptus populnea* woodland	*Eucalyptus populnea*	25	>200m	Yes	14	46	

Site	RE	Vegetation community description	Canopy tree species	Total canopy cover (%)	Distance (m) to surface water	Evidence of scratches	Number of trees with Koala scats beneath (out of 30)	SAT score (%)	Photo
OP 2	11.3.17	Very narrow (20m), long (500m) the vegetation patch is between two fence lines	*Acacia harpophylla* *Eucalyptus populnea*	18 2	0	No	0	0	

4. Survey findings

Evidence of Koala activity was recorded at 69% of the sites surveyed. Evidence of Koala activity consisted of a scratches and scats. Sites with medium to high SAT scores (>30%) are in close proximity and likely reflect the fragmented nature of remnant vegetation patches across the project area.

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APPENDIX 2
Policy 6 Koala Plan

Policy 6: Vegetation clearing practices

Purpose

The purpose of this policy is to:

- identify when and where there is a requirement for sequential vegetation clearing and the presence of a koala spotter;
- outline best practice approaches for clearing of vegetation where koalas may be present.

Background

Felling trees within koala habitat can result in the death of, or serious injury to koalas that are present in those trees or in trees adjacent to those trees being cleared.

Applicability of the policy

This policy is applicable to all vegetation clearing occurring within Koala Districts A and B as prescribed by the *Nature Conservation (Koala) Conservation Plan 2006*.

Requirements

The *Nature Conservation (Koala) Conservation Plan 2006* contains provisions relating to how koala habitat trees are to be cleared in Koala Districts A and B to ensure against the injury of resident koalas.

It is a requirement of a person authorised to fell trees, or that person's delegate, to ensure all clearing of koala habitat trees in Koala District A and B is undertaken using a sequential clearing technique. In addition, all koala habitat trees being cleared in a koala habitat area within District A must be in the presence of a koala spotter.

Under *Nature Conservation (Koala) Conservation Plan 2006* sequential clearing means:

(1) clearing of trees is carried out in a way that ensures koalas living in or near the area being cleared (the clearing site) have enough time to move out of the clearing site without human intervention, including in particular, for a clearing site with an area of more than 6ha, by:
  (a) carrying out the clearing in stages; and
  (b) ensuring not more than the following is cleared in any one stage:
    (i) for a clearing site with an area of 6ha or less—50 percent of the site's area;
    (ii) for a clearing site with an area of more than 6ha—3ha or 3 percent of the site's area, whichever is the greater; and
  (c) ensuring that between each stage there is at least one period of 12 hours that starts at 6p.m. on a day and ends at 6a.m. on the following day, during which no trees are cleared on the site; and

(2) clearing of trees is carried out in a way that ensures, while the clearing is being carried out, appropriate habitat links are maintained within the clearing site and between the site and its adjacent areas, to allow koalas living on the site to move out of the site; and
(3) no tree in which a koala is present, and no tree with a crown overlapping a tree in which a koala is present, is cleared.

A koala spotter means a person who has demonstrated experience in locating koalas in koala habitats or conducting fauna surveys.

Prior to the commencement of, and during felling operations, it is the responsibility of the koala spotter to identify trees in which a koala is present and any trees where their crown overlaps trees in which a koala is present and convey this information to the person(s) conducting the clearing.

Best practice approaches

The EPA encourages a best practice approach to all vegetation clearing where koalas may be present to ensure injury or harm of potentially resident koalas is limited to the greatest possible extent.

Sequential clearing

Sequential clearing can be achieved by a variety of means. Many of these approaches will be site specific. However, the following methods are recommended:

(1) The thinning, or partial removal, of vegetation on a site that has a known koala presence is recommended, at least for the initial stage of clearing. This provides the opportunity for koalas utilising the site to occupy some of their current home range and allow animals an extended period of adjustment to the clearing. This can be achieved, particularly at future residential development sites, by:
  (a) the sequential thinning of trees in each progressive stage of development, where the density of vegetation on the site is reduced (by approximately 50 to 70 percent), the remainder of which is retained throughout the site and is removed only when required to build on an individual lot;
  (b) timing the thinning so that a minimum of one month of no disturbance is achieved after thinning and before lots are developed; and
  staging the thinning so that there is compliance with the sequential clearing provisions of the *Nature Conservation (Koala) Conservation Plan 2006*.

(2) The direction of sequential clearing should be away from threatening processes or hostile environments, and towards any retained vegetation or habitat links, ensuring:
   (a) koalas are not pressured, through loss of habitat, to cross roads or move through developed or disturbed areas, such as residential areas or areas that require movement of greater than 100m over cleared ground to reach suitable habitat;
   (b) koalas are not left occupying an 'island' of habitat between hostile environments, such as a road and a cleared area, unless there are no other more suitable habitat areas in which to direct koalas; and
   (c) koalas can safely leave the site of clearing and relocate to adjacent habitat.

Koala spotters

(1) It is recognised that koalas are distributed widely across the landscape and are often found in areas outside designated koala habitat areas. This may include Koala Living Areas and areas that are not mapped as koala habitat. It is strongly recommended that, as a best practice approach, a koala spotter be engaged at any sites where there is a known, or likely, koala presence.

(2) It is the responsibility of the person authorised to fell trees, or that person's delegate, to appoint a koala spotter prior to the commencement of clearing operations.
A person is likely to be suitably qualified as a koala spotter if they have:
   - worked with koalas in their natural habitat — by conducting koala surveys, koala monitoring, or involved with koala rescue, for example; or
   - experience in fauna surveys or fauna spotting in koala habitat areas.

(3) A koala spotter is not to be involved in the clearing of vegetation while they are responsible for identifying koalas present on the site.

Koalas can be difficult to see, even to the trained eye, and particularly when resting in the tops of tall leafy trees. Koalas can also jump from one tree to another. Consequently, continual surveillance of koalas present on the site is likely to be required during clearing operations to ensure against accidentally felling or interfering with a tree that has a resident koala.

(4) A koala spotter is not to physically move koalas from a tree in which they are residing to another location. Each tree identified by the koala spotter as being a risk to koalas if felled, should not be felled, damaged or interfered with until the koala has moved from the felling site of its own volition.

Granting clearing approvals

The clearing of vegetation may require an approval under the Integrated Planning Act (schedule 8), a local government planning scheme, or a local government local law.

Any approval associated with the clearing of vegetation within Districts A and B should be given in consideration of the potential presence of koalas.

Where appropriate, it is recommended to either directly include conditions, based on the practices set out in this policy, or provide additional information with any approval regarding the requirements under the *Nature Conservation (Koala) Conservation Plan 2006* for the clearing of koala habitat trees.

This policy was accurate at the time the Koala Plan was declared. A current version of this policy can be found at www.epa.qld.gov.au

APPENDIX 3
Koala Fencing Guidelines

KOALA EXCLUSION OR GUIDE FENCING

RECOMMENDED DESIGN, INSTALLATION & MAINTENANCE

Determine significance of vegetation and fauna habitat that would need to be removed prior to any decision to install fencing

DESIGN DESCRIPTION ONE-WAY EXCLUSION FENCE:
Minimum 1.2m high
Chain wire
60cm flat Colorbond (or similar material) attached beneath rail on exclusion side of fence
25cm diameter 1.5m high treated timber pole located every fourth post, on inclusion side.
Fence is to be pegged down or within a cement strip to ensure Koalas do not have opportunity to traverse under fence.
Approximate cost: $120/m

DESIGN DESCRIPTION SELF-CLOSING GATE:
1.2m high
Exclusion features consistent with adjoining fencing.
Spring hinges to ensure gate closes automatically
Approximate cost: $250 each

INSTALLATION:
Assessment for the significance vegetation for Koala and other fauna prior to removal
Vegetation cleared and maintained at least 3m away from fence where practicable
At roadway junction with Lagoon Creek the idenification of a safe movement under road is to be in place prior to installing exclusion fence.

MAINTENANCE:
Regularly inspect integrity of fencing and carry out repairs
3m cleared zone to be maintained
Ensure no tree branches overhang fencing

An example of a Koala-proof fence providing an example of the design, however the lack of maintenance has significantly reduced its effectiveness.