Bowen Coking Coal:
Bluff Coal Mine Project
EPBC 2013/7064
Biodiversity Offset Management Plan




earthtrade

Date: 10 June 2024

Prepared for: Bowen Coking Coal Ltd ABN: 72 064 874 620

Our Reference: 20212430G

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ACKNOWLEDGEMENTS AND DISCLAIMER

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ACKNOWLEDGEMENTS:

This document has been prepared by Environmental Offset Solutions Pty Ltd t/a Earthtrade with support from Bowen Coking Coal Ltd.

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Declaration

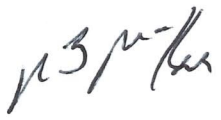
I declare that to the best of my knowledge, all the information contained in, or accompanying this document is complete, current and correct. I am duly authorised to sign this declaration on behalf of the proponent/approval holder. I am aware that:

a. *section 490 of the* Environment Protection and Biodiversity Conservation Act 1999 *(Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.*

b. *section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) where the person knows the information or document is false or misleading.*

c. *the above offences are punishable on conviction by imprisonment, a fine or both.*

Signed:



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EPBC Referral Number: EPBC 2013/7064

EPBC Offset Management Plan

Date: 10 / 6 /2024

Executive summary

The Bluff Coal Mine Project (the **Project**) involves the operation of an existing open-cut coal mine in the southern Bowen Basin, immediately south of the town of Bluff, and 20 kilometres (**km**) east of Blackwater. The mine is adjacent to the Blackwater rail line which connects it to the port of Gladstone.

In July 2014 the Department of the Environment (**DoE**) (now the Department of Climate Change, Energy, the Environment and Water (**DCCEEW**)) approved the Project under the *Environmental Protection and Biodiversity Conservation Act 1999* (**EPBC Act**) (EPBC 2013/7064) subject to conditions.

Bowen Coking Coal Limited (**BCC**) purchased the Project in November 2021 after the previous owner went into administration. The mine and associated infrastructure have been redesigned with a smaller footprint, resulting in a reduction in the residual impacts of the Project to MNES.

The EPBC Act approval conditions include the requirement for the project proponent to provide biodiversity offsets for significant residual impacts to matters of national environmental significance (**MNES**) and to prepare a Biodiversity Offset Management Plan (**BOMP**) for the approval of the Minister. This document is the BOMP for the Project that has been prepared to meet all offset obligations and conditions for **MNES** under the approval given. This BOMP describes how the offsets for residual impacts to MNES will be delivered.

Impacts to MNES requiring offsets are for habitat for the koala (*Phascolarctos cinereus*), listed as vulnerable under the EPBC Act at the time of the referral decision. The EPBC approval conditions include the requirement to identify the extent of squatter pigeon (southern) (*Geophaps scripta scripta*) habitat within the koala offset area (see condition 7. b). The entire koala offset area is suitable habitat for the squatter pigeon. An overview of the impacts to koala habitat and the resultant offset requirements are summarised in *Table* 1.

The offsets for this fauna species will be located on an adjacent agricultural property to the south and east of the Project known as “Colorado”, which is owned by the Project proponent.

Detailed environmental assessments and survey work were undertaken for the impact site to quantify the extent of residual impacts to MNES (see *Attachment 1A*).

A separate environmental survey has been undertaken at the terrestrial offset sites at Colorado to confirm the suitability of the terrestrial offsets (provided in *Attachment 1B*).

The vegetation in the offset area comprises large sections of remnant and regrowth vegetation of similar communities to those in the impact area. The vegetation provides habitat for the MNES that are to be offset as per the EPBC conditions of approval. The offset property forms part of a large landscape corridor, and is dissected by Bone Creek and Walton Creek. These waterways reinforce this connectivity and provide riparian habitat for the species.

This BOMP demonstrates that the proposed offset site on Colorado meets the principles of the EPBC Act Environmental Offsets Policy (**EOP**) and is a suitable offset for approved impacts resulting from the Bluff Coal Mine Project. This plan utilises the findings of the ecological assessments from both the impact site and offset area to outline how the offset obligations under the EOP are addressed. The plan demonstrates that the offset area is suitable to meet all the EOP requirements and the approval conditions.

This BOMP has been prepared to meet all offset obligations specified in the EPBC Approval 2009/5173. As the approval holder, BCC commits to the implementation of this BOMP.

Table 1: Summarised project impacts versus proposed offset area values

Protected matter and habitat definition (approval conditions)	EPBC status	Impact	Habitat quality score	Offset area (ha)	Habitat quality start score	Habitat quality completion score
Koala habitat (*Phascolarctos cinereus*)	Vulnerable	248.94 ha	5.69	670.7ha of remnant vegetation 207.6 of regrowth vegetation	4.54	6.87
Protected matter and habitat definition (approval conditions)	**EPBC status**			**Area identified as squatter pigeon habitat (ha) #**		
Squatter pigeon (southern) habitat (*Geophaps scripta scripta*) Foraging and breeding habitat	Vulnerable			670.7ha of remnant vegetation 207.6 ha of regrowth vegetation		

** The Koala EPBC Act listing was upgraded to endangered in February 2022; however, the Project BOMP is subject to the threatened species listing at the time of the controlled action decision.*

 # As per approval condition 7.b), the extent of the squatter pigeon habitat identified within the koala offset area is the entire offset area.

Part A: Project Details and Impact Areas

1 Introduction

1.1 Project description

Bowen Coking Coal Limited (**BCC**) purchased the Project in November 2021 after the previous owner went into administration. Since then, the mine and associated infrastructure have been redesigned with a smaller footprint, resulting in a reduction in the residual impacts of the Project to MNES.

The Bluff Coal Mine project is located immediately south of the township of Bluff, approximately 20 km east of Blackwater in Central Queensland (refer to *Figure 1*). The Project comprises a existing open cut mine producing 1.2 Mtpa of ultra-low volatile pulverized coal injection coal. The Project involves a 1,116 hectare (**ha**) mining lease (**ML**) area (MLA80194). The resource at Bluff is estimated to be at least 13.5 Mt, with a mine life of 10 to more than 20 years. The revised plan of the Project incorporates off-site coal processing and rail loading to avoid the requirement for a rail loop. The Run of Mine will be located at the crest of the main coaling ramp to minimise haul distances. It is estimated the Project will involve a fleet of 250 to 600 tonne excavators in conjunction with 190 tonne trucks for overburden removal and a small excavator to recover coal. Water trucks, service trucks, graders, dozers and conventional vehicles will also form part of the mining fleet. An off-site coal processing plant is utilised for coal washing and transport via rail to the Port of Gladstone for sale into export markets.

The Project encompasses the Brigalow Belt North and South Bioregions in Central Queensland. It is located within the Mackenzie River drainage sub-basin of the Fitzroy River Basin.

Figure 1: Project location

1.2 Purpose and objectives of this management plan

The purpose of this BOMP is to address the requirements of EPBC 2013/7064 approval conditions dated 31 July 2014 relating to MNES offset requirements and offset delivery. The requirements are provided in *Table 2*, and the BOMP reference section that addresses each requirement.

The EPBC approval provides for the clearing of 250 ha of critical koala habitat from the project area. Following the purchase of the Project, refinement of the life of mine plan and improved infrastructure design resulted in a reduced proposed impact compared to impacts previously approved. The significant residual impact of the Project to critical koala habitat is 248.9 ha. See Section 3 for more details.

This BOMP details the offsets that will be provided for 248.9 ha of impact on critical koala habitat, and identifies the area of squatter pigeon habitat within the koala offset area (being the entire offset area).

The environmental outcomes of this BOMP are specific improvements in ecological values in habitat for each of the matters impacted by the Project. These improvements are defined in detail in *Section 9* of this document (Offset completion criteria and performance targets).

Table 2: EPBC approval conditions for offsets addressed in this document

Condition	BOMP section or comment
Biodiversity Offset Management Plan	
7. The person taking the action must prepare and submit a Biodiversity Offset Management Plan (BOMP) to the Minister for approval. The BOMP must include:	*This document*
a) details of known critical Koala habitat to compensate for the loss of a maximum of 250 hectares of critical Koala habitat in the project area;	*See Section 6.1.1*
b) identify the extent of Squatter Pigeon habitat within the offset area, as established by Condition 7(a);	*See Section 6.2.1*
c) details of the offset attributes (including maps in electronic GIS format with accompanying shapefiles), site descriptions, environmental values relevant to Koala, connectivity with other Koala habitat and biodiversity corridors, a rehabilitation program, and conservation and management measures for long-term protection;	*See Section 6.1*
d) a detailed survey and description of the proposed offset site to clearly identify baseline conditions, establish performance indicators and discuss methods for adaptive management. This must include: i. a description (prior to any management activities, hence a baseline) of the current condition of the extant vegetation of each offset area. location of surveypoints (GPS reference); ii. the quantity of habitat for Koala (in hectares), found within the offset area; iii. the condition class of habitat for Koala found within the offset area; iv. vegetation condition mapping; v. photo reference points; vi. tree age class representation; and vii. description of Koala habitat including condition, type and connectivity.	*See Section 6.1.1*

Condition		BOMP section or comment
e)	details of measures to be undertaken to maintain and improve Koala habitat within the Offset Area in line with the *Nature Conservation (Koala) Conservation Plan 2006 and Management Program 2006-2016* (or successor management plan), including measures to ensure:	*See Section 8*
i.	a map showing areas to be managed;	*See Figure 6*
ii.	management actions for each area and details of methods to be used. These must include measures to reduce and control weeds.	*See Section 8*
iii.	timing of management activity for each area;	*See Section 8*
iv.	performance criteria for each area;	*See Section 9*
v.	a monitoring plan to assess the success of the management activities measured against the baseline condition. The monitoring must be statistically robust and able to quantify change in the condition of the critical Koala habitat. This must include, but not be limited to, control sites and periodic ecological surveys to be undertaken by a suitably qualified ecologist;	*See Section 11*
vi.	a description of the potential risks to successful management against the performance criteria, and a description of the contingency measures that would be implemented to mitigate these risks;	*See Section 7*
vii.	a process to report to the Department, the progress of management activities undertaken in the offset areas and the outcome of those activities, including identifying any need for improved management and activities to undertake such improvement;	*See Section 11*
viii.	details of the various parties responsible for management, monitoring and implementing the management activities, including their position or status as a separate contractor;	*See Section 8.1*
ix.	regeneration, if utilised, must be with a similar composition of over storey species (type, density and diversity) compared to the local variant of Regional Ecosystem (RE) found in or adjacent to the nominated offset area and demonstrated to be Koala habitat; and	
x.	trees used during rehabilitation have been propagated from local seed stock, where possible.	
8.	The approved BOMP must be implemented.	*This document*
9.	The approval holder must, by 31 March 2023, register a legally binding conservation mechanism to provide long-term protection to the offset area/s approved by the Minister in the BOMP.	*See Section 12*
10.	The most recent approved version of the BOMP must remain accessible to the public on the website for the duration of the action.	*See Section 14*

1.3 Commitments made in the BOMP

This section summarises the commitments made throughout this BOMP to achieve ecological benefit(s) for the relevant protected matters. These ecological benefits will be achieved through the integrated implementation of many elements of this BOMP. Additional commitments are also made in alignment with the general conditions of the approval. *Table 3* below lists each of these commitments and provides references to the sections in this BOMP where these commitments are detailed.

Table 3: Commitments made in this BOMP

Commitment	Relevant approval condition	BOMP section or comment
The approval holder will prepare and submit a Biodiversity Offset Management Plan (BOMP) to the Minister for approval.	7.	*This document*
The approval holder will implement the approved BOMP.	8.	*See Section 14*
The approval holder also commits to registering a legally binding conservation mechanism to provide long-term protection to the offset area as soon as practicable after the Minister's approval of the BOMP (subject to DoR processes to register the legally binding mechanism).	9.	*See Section 12*
The approval holder will ensure that the most recent approved version of the BOMP remains accessible to the public on the website of the approval holder for the duration of the action.	10.	*See Section 14*
The approval holder will notify the Department in writing of non-compliance with any condition of the approval as soon as practical and within no later than two business days of becoming aware of the non-compliance.	12.	*See Section 13*
The approval holder will maintain accurate records substantiating all activities associated with, and measures taken to implement the approved BOMP, and make them available upon request to the Department.	13.	*See Section 8.1 and Section 11*
Within three months of every 12-month anniversary of the commencement of the action, the approval holder will publish a report on its website addressing compliance with each of the conditions of this approval, including the implementation of this BOMP. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval will be provided to the Department at the same time as the compliance report is published.	14.	*See Section 11*
If the approval holder wishes to carry out any activity otherwise than in accordance with this BOMP, the approval holder will submit to the Department for the Minister's written approval a revised version of the BOMP. The varied activity will not commence until the Minister has approved the varied BOMP in writing. If the Minister approves the revised BOMP, that BOMP will be implemented in place of the BOMP originally approved.	16.	*See Section 13*

Commitment	Relevant approval condition	BOMP section or comment
If the Minister requests that the approval holder make specified revisions to the BOMP, the approval holder will develop and submit the revised BOMP for the Minister's written approval. The approval holder will implement the revised BOMP. Unless the Minister has approved the revised BOMP, then the approval holder will continue to implement BOMP originally approved.	17.	*See Section 13*

1.4 Area for offset acquittal

The proposed offset property is owned by the proponent of the Project, Bowen Coking Coal Limited. The offset property is located adjacent to the east and south of the Project area. It is approximately 1,960 ha and is described as Lot 11 on H4023 and Lot 12 on H4035. Lot 11 on H4023 is also within the ML and is partly affected by the Project footprint. The property is located within the Mackenzie River drainage sub-basin of the greater Fitzroy River Basin, and within the Central Highlands Regional Council (**CHRC**) local government area. The context of the property on a regional scale is shown in *Figure 2*.

Land within the offset property is used predominantly for cattle grazing. The property supports large sections of remnant and high value regrowth vegetation, and although all areas have been subjected to historical and current disturbance in the form of timber harvesting and fire, the proposed offset property forms part of a large landscape biodiversity corridor (*Figure 3*).

The selected property is considered suitable to provide the values required to address the EOP principles. Consideration was also given to future property planning and any potential future use for the property to avoid the potential for conflicting land use pressures with the offset site.

Additional offset areas for other projects of the proponent will be considered on this property in the future, enabling the offset areas to be further connected and provide larger tracts of habitat for the species being protected. Locating offsets for various projects together will improve the biodiversity value of each individual offset, and strengthen other values such as connectivity and resilience. Management efficiencies for each offset will be achieved where the management actions, reporting timeframes and monitoring can be aligned, where appropriate. This will achieve efficiencies in managing many aspects of the cumulative offset area, such as management of weeds, feral animals, fire, and monitoring.

Figure 2: Offset property – regional context

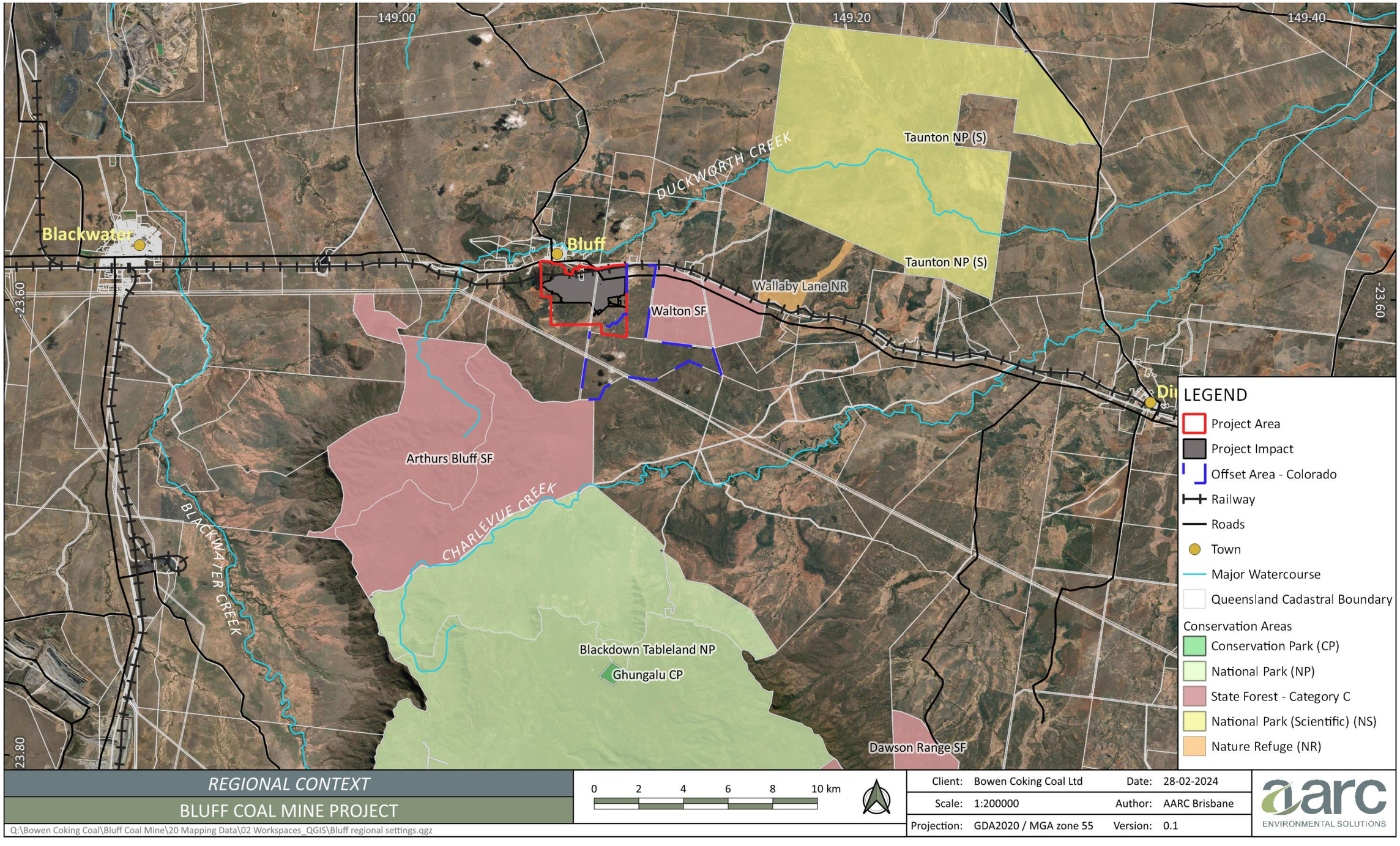
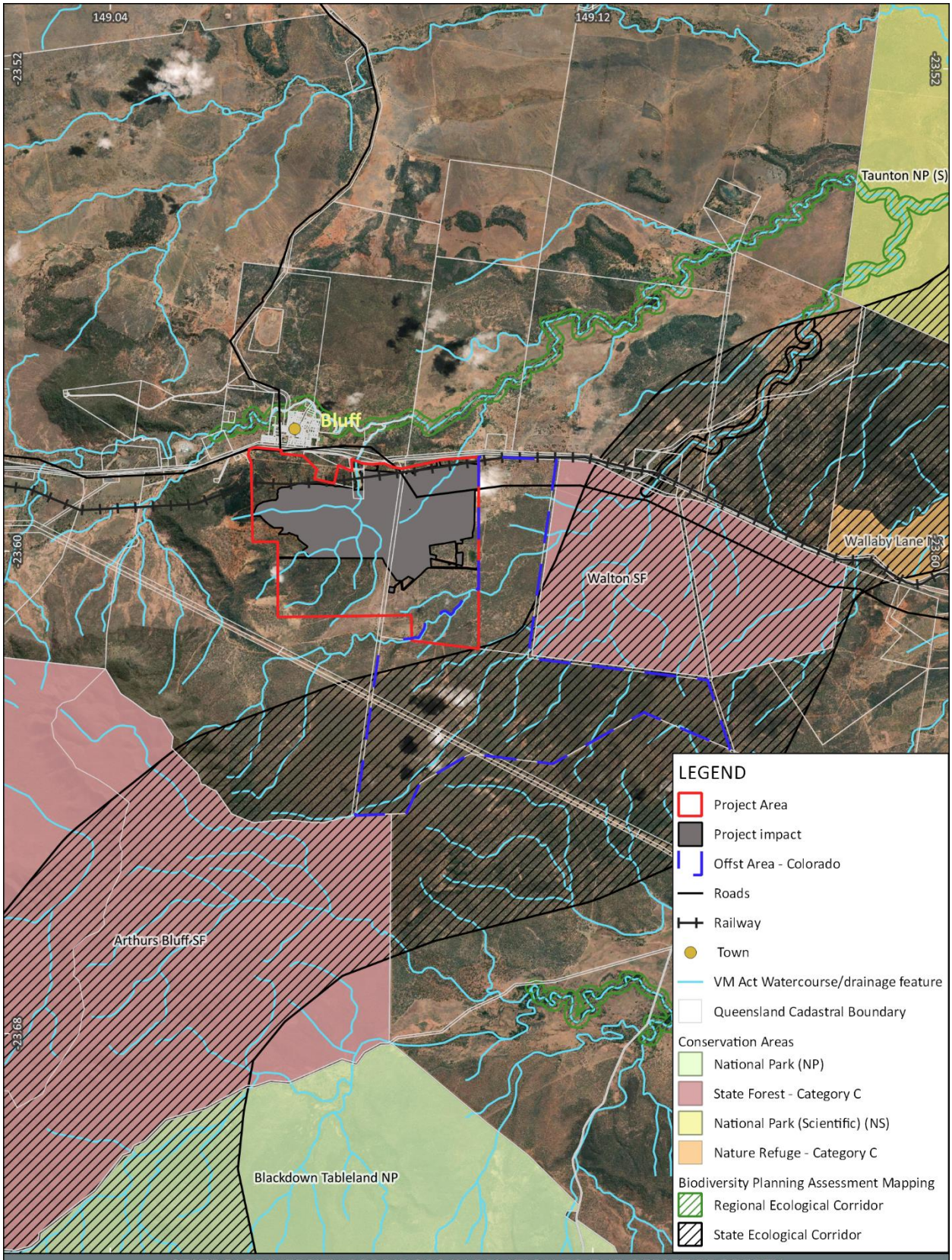


Figure 3: State biodiversity corridors in relation to the offset property



1.5 Plan structure

The BOMP is divided into 2 parts – **Part A** (Project Details and Impact Areas) and **Part B** (Offset Land Management Details).

Part A contains:

- Introduction to the Project and the purpose of the plan
- How the offsets address the EOP and EPBC Plans
- An overview of the proposed offset properties
- Impact area description
- Offset property information, including the landscape values
- Offset regional ecosystems (**RE**s) and habitat quality scoring (**HQS**).

Part B contains the Land Management plan, containing:

- Risk analysis
- Offset management measures
- Completion criteria and performance targets
- Monitoring and reporting
- Adaptive management and plan review.

2 EPBC Act Environmental Offsets Policy and framework

This section describes how the proposed offset meets the relevant requirements of the EPBC Act Environmental Offsets Policy (October 2012) (**EOP**), plans and guidelines.

2.1 Policy principles

The EPBC Act EOP sets out eight key overarching principles to determine the suitability of offsets. *Table 4* outlines each of the policy principles and how it has been considered in the BOMP, with a reference to the relevant BOMP section.

Table 4: EPBC Act Environmental Offset Policy principles

Policy principle	Project offsets
Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the protected matters.	The offset will deliver a conservation outcome by providing habitat for the koala and squatter pigeon (southern) species. The habitat will be managed to improve the habitat values for those species, and secured as a declared area under the *Vegetation Management Act 1999* (QLD) (**VM Act**) to ensure legal protection of the offset area.
Suitable offsets must be built around direct offsets but may include other compensatory measures.	100% of the Project's MNES offset obligations for koala will be acquitted by the proposed direct land-based offsets. The offset area also provides large areas of habitat for squatter pigeon.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.	The status of the impacted threatened species has been taken into account by the offset assessment guide that has been used to calculate the offset area requirements. The koala is listed as endangered under the EPBC Act.
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter.	The extent of the offset has been calculated using ecological reports that include both flora and fauna surveys, for both the impact and offset sites to inform inputs into the offset assessment guide (**OAG**). The inputs to the OAGs for each of the protected matters impacted are detailed in *Section 6.*
Suitable offsets must effectively account for and manage the risks of the offset not succeeding.	The risks associated with the offset have been assessed (*Table 11*) and mitigation and appropriate management actions proposed in the offset area management measures shown in *Table 12*. In addition, uncertainty, and therefore risk, associated with averted loss and net gain in habitat quality were addressed by applying the offset assessment guide.
Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs.	Vegetation clearing as a native forest practice, or a forest practice; the use of fire to manage regrowth and grazing on the offset site; is not currently prohibited by legal mechanisms at either the local, state or Australian government legislative level. The area is zoned rural and has been used for timber harvesting and cattle grazing previously. Areas of the offset property have been subject to vegetation clearing[1] since the late 1970s as part of the

[1] *Vegetation Management Act 1999*, Schedule dictionary

Policy principle	Project offsets
	Brigalow Development Scheme. The current regulated vegetation will be secured via a declared area that has its head of power under the VM Act. See *Section 12* for further detail.
Suitable offsets must be efficient, timely, transparent, scientifically robust and reasonable	The proposed offsets will be efficient and timely as the offset will be established and implementation commenced within 6 months of the Minister approving this BOMP. The offsets' scale and suitability are transparent, and the offsets are based on the terrestrial ecology reports prepared by suitably qualified ecologists for the impact and offset sites (*Attachment 1A* and *Attachment 1B*); They have been prepared using the EPBC Act OAG inputs and calculators. Refer to *Section 6* for further detailed application of the OAG.
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.	The offset site was surveyed from 5-14 February 2019, providing the baseline habitat quality assessment and these scores were compared against the relevant biocondition benchmarks[2]. Habitat quality assessments were conducted in accordance with the *Guide to Determining Terrestrial Habitat Quality Version 1.2, 2017*, which involved collecting spatial data; and conducting in situ vegetation surveys, assessing site condition, spatial context as well as targeted species habitat criteria. Refer to Appendix C of the Baseline Offset Site Investigation Report at *Attachment 1B*. Future habitat assessment measurements will be conducted in accordance with this plan during its implementation phase. Monitoring and reporting are detailed in the Offset Area Management Measures outlined in *Table 12*, and the monitoring schedule and reporting schedule are shown in *Table 15* and *Table 16*. The offset will be protected from clearing and secured via a declared area that has its head of power under the VM Act. Refer to *Section 12* for further detail.

[2] Benchmarks are quantitative values derived from data collected from field-based reference sites for each site condition attribute assessed in BioCondition

2.2 Addressing relevant EPBC plans and advice

The EOP states that an offset should address key priority actions for the impacted MNES in any approved recovery plans, threat abatement plans, conservation advice, ecological character description or approved Commonwealth Management Plan. *Table 5* summarises how this plan addresses the relevant Conservation Advice, Recovery Plans and Threat Abatement Plans, on the offset sites.

Table 5: Conservation Advice and Threat Abatement Plans addressed in the BOMP

Document	Key threats	Section addressed in document
Conservation advice for Phascolarctos cinereus *(Koala).* (2022) DAWE, Canberra. *National Recovery Plan for the Koala:* Phascolarctos cinereus *(combined populations of Queensland, New South Wales and the Australian Capital Territory.* (2022) DAWE, Canberra	<u>Climate change driven processes and drivers:</u> • Loss of climatically suitable habitat Areas that are climatically suitable for koalas are contracting. Climate change predictions indicate drier, warmer conditions across the koala's range. Current and future climate change projections indicate a progressive eastward and southwards contraction in the koala's suitable climate envelope and consequent suitable habitat (Adams-Hosking et al. 2011). • Increased intensity/frequency of drought Low rainfall has been linked with physiological stress to koalas due to low moisture levels, causing negative effects on population viability (Davies et al. 2013). In the future, average winter and spring rainfall are predicted to continue to decline across the koala's range (BoM 2021). • Increased intensity/frequency of heatwaves Due to climate change, average temperatures across the koala's range will continue to increase across all seasons resulting in an increased frequency and intensity of heat stress days and heat wave episodes (BoM 2021). Heat stress threats will synergistically interact with drought, further exacerbating the impacts of reduced water availability. • Increased intensity/frequency of bushfires	For the contribution to biodiversity corridors and connectivity – Refer to *Section 4.1.1*. The offset site was selected for its potential to provide a substantial increase to the habitat, connectivity and other ecological values within the surrounding area. The area is currently composed of degraded tracts of regulated and regrowth vegetation associated with Bone Creek and Walton Creek. Protecting these eucalypt forests from native timber harvesting and inappropriate fire will add significant value to the area by improving the condition and connectivity of local and regional koala habitat. The connecting of the protected areas around the offset site will increase the ability of the koala to move to moister areas during periods of drought and increased heat waves. The connectivity to the local creeks will give access to and enable the koalas to shelter in trees of a higher moisture density (RE 11.3.4). The prevention of harvesting of larger trees will provide more and larger shelter as the regional ecosystem rehabilitates to scores closer to the benchmark. Additionally, the offset will assist in landscape connectivity and context by improving the existing regulated vegetation adjacent to and within the landscape corridors that link the important refuges of the Arthurs Bluff State Forest, Walton State Forest, Blackdown Tableland National Park and Taunton National Park.

Document	Key threats	Section addressed in document
	Australia will continue to experience a harsher fire-weather climate into the future (BoM 2019, 2021). The fire season length is increasing and the number of catastrophic fire days will increase in the future by an estimated 15-70% by 2050 (Climate Council 2019). A broad range of fire-related threats exist including high frequency fire, high severity fire, shifts in fire season, biodiversity loss, declining ecological mechanisms, shifts in biotic interactions including reproduction and fire-predator interactions, fire-drought interactions, and fire-fragmentation interactions which can be amplified by land clearing and logging (Bradshaw et al. 2018; Leavesley et al. 2020). All of these threats will have a significant impact on koala habitat and resident populations. • Declining nutritional value of foliage Physical disturbance (e.g., logging during forestry activities and/or fire) alters tree species composition and can favour tree species that do not support the koala's nutritional requirements (Au et al. 2019). Additional research is required to assess how elevated levels of CO_2 affect nitrogen and available nitrogen (which integrates the effects of tannins) (DeGabriel et al. 2009). Bushfire effects on the nutritional value of eucalypt regrowth (e.g., epicormic growth) are unknown and research has been initiated.	Fire is not permitted in the offset area unless for fuel reduction purposes, at no less than seven-year intervals and no more than 30% of the area at any one time (as per Queensland DES regional ecosystem descriptions fire management guidelines) (refer to *Table 12*). Fuel reduction burns will be used as a last resort, and if utilised will be planned to be low intensity with no canopy scorch, with the aim to reduce fuel load in the ground cover layer. This practice aims to prevent unplanned high intensity burns that result from a build-up of fuel. Appropriate fire management will mitigate the increased risks of fires on the site. The prevention of harvesting of larger trees will provide more and larger foraging and shelter trees as the regional ecosystem rehabilitates to scores closer to the benchmark. For the contribution to biodiversity corridors and connectivity – Refer to *Section 4.1.1*. The establishment of the offset area which adjoins the landscape corridors, as well as buffers and increases in extent and condition of the habitat, will reduce the level of physical disturbance and act to reduce the alteration in tree species composition.
	<u>Clearing and degradation of koala habitat</u> Human activities (e.g., deforestation and land clearance for grazing, agriculture, urbanisation, timber harvesting, mining and other activities) have resulted in habitat loss, fragmentation and degradation.	Refer to *Table 12* - Forestry and native vegetation - clearing is not allowed under the management plan. No forestry or timber harvesting activities are to be conducted during the period of the declaration of the offset area. Forestry and native timber harvesting practices in the offset area remove large trees that provide shelter and food and may also contain hollows and deadwood. It is therefore considered a potential threat to the quality of the habitat.
	<u>Increased mortality due to vehicle strikes and dogs</u>	

Document	Key threats	Section addressed in document
	Vehicle related mortality occurs regularly on roads in close proximity to occupied koala habitat (Gonzalez-Astudillo 2018; Queensland Government 2021). Dog attacks are also a significant cause of death and injury especially in areas within and adjacent to peri-urban and residential areas (DPIE 2020). Koalas are unable to adapt to these threats and as human activities continue to expand into koala habitat, trauma from these threats will continue.	Refer to *Table 12*: Access will be restricted. The offset area is on a privately owned agricultural property (*Figure 2*) with access to the area restricted to the landholders. Access to the offset area property is restricted by boundary fencing to prohibit access to the offset area. Therefore, impacts to resident koala populations arising from car strikes are unlikely. *Table 12:* Feral animals – monitoring and control as detailed. Existing populations of feral animals (feral cats, dogs and pigs) will be controlled within the offset areas in accordance with the *Biosecurity Act 2014* (Qld). Monthly inspections to record the presence of wallow holes, tracks and visual incidents, e.g. any injury to or predation of koalas, in the offset area will be undertaken. On being notified or becoming aware of the presence of large numbers, for example, approximately 10 feral animals or multiple tracks in the offset area at any one time, or any predation of koalas, the Landholder is to implement feral animal control measures within one month.
	Koala retrovirus (**KoRV**) and Chlamydia (*Chlamydia percorum*) Wild populations carry disease pathogens. Inadvertent spread of disease also occurred historically following koala translocations. Disease can be a major contributor to population decline and reduces population viability. Chlamydia causes infertility, blindness and death (Polkinghorne et al. 2013). The prevalence of disease (chlamydiosis) has been found to increase following extreme stress from hot weather, drought, habitat loss and fragmentation (Lunney et al. 2012; Davies et al. 2013). KoRV was relatively recently identified and is thought to be responsible for a range of conditions, including leukaemia (Tarlinton et al. 2005) and an immunodeficiency syndrome. Up to 100% of koalas in Queensland and NSW have KoRV. There is some evidence that chlamydiosis may be exacerbated by KoRV (Tarlinton et al. 2005). KoRV has endogenised in koalas (Tarlinton et al. 2006) in Queensland and New South Wales. That is, it has infected germ line cells (spermatozoa or oocytes) and is transmitted genetically (by inheritance) from parents to offspring.	There is no known treatment for disease which is prevalent in the populations naturally. The establishment of the offset area which adjoins the landscape corridors, as well as buffers and increases in extent and condition of the habitat may act to reduce some of the environmental stresses that are thought to accentuate the diseases.

Document	Key threats	Section addressed in document
	Although this is a known mechanism of transmission, KoRV may also spread from koala to koala (horizontal spread) by close contact, and from infected mothers to their joeys via the milk, in a manner similar to the way that many other retroviruses spread (Hanger 1999). Whether KoRV can be transmitted by biting insects has yet to be determined.	
Conservation Advice: Geophaps scripta scripta *squatter pigeon (southern)* (2015) Threatened Species Scientific Committee. Canberra	<u>Ongoing vegetation clearance and fragmentation</u> Birds do not move far from woodland trees that provide protection from predatory birds, and do not typically forage further than 100 m from remnant trees or patches of wooded habitat (DoEE 2018). The population declined rapidly during the late 19th and early 20th centuries and continued to decline in NSW and southern Queensland where it is now very rare (Cooper et al., 2014). In NSW, the disappearance of the subspecies has been attributed to overgrazing at times of drought, followed by clearing of vegetation. Current threats include ongoing vegetation clearance and fragmentation,	Refer to *Table 12*: Forestry and native vegetation - clearing is not permitted under the plan. No forestry or timber harvesting activities will be undertaken during the period of the declared area. Forestry and native timber harvesting practices in the offset area is considered a potential threat to the quality of the vegetation community and habitat due to a reduction in cover and fragmentation of habitat.
	<u>Overgrazing of habitat by livestock and feral herbivores; trampling of nests by domestic stock</u> The population declined rapidly during the late 19th and early 20th centuries and continued to decline in NSW and southern Queensland where the species is now very rare (Cooper et al., 2014). In NSW, the disappearance of the subspecies has been attributed to overgrazing at times of drought, followed by clearing of vegetation.	Refer to *Table 12*: Grazing – grazing is not permitted during the wet season or squatter pigeon breeding season; ground cover levels will be monitored and managed. Stock will be grazed in the offset areas for fuel reduction purposes during September to January, or until the wet season starts, to avoid the squatter pigeon breeding season and nest trampling.
	<u>Introduction of weeds</u> Squatter pigeons have a mainly granivorous diet, mostly feeding on the seeds of legumes in the family Fabaceae (45% of food volume) including those of exotic pasture plants such as *Stylosanthes* spp., and native grasses in the family Poaceae (23% of food volume) (Crome 1976; Higgins and Davies 1996). They occasionally forage in sown grasslands and pastures, feeding on exotic legumes such as *Stylosanthes* spp. (Crome 1976). A high weed cover results in competition for the bird's diet.	Refer to *Table 12*: Pest plants – will be reduced to less than 10% of ground cover. Weed control will be undertaken throughout the offset areas and then periodically, as required, to treat the weeds at the optimum time in their life cycles. The practices will control and minimise the spread of existing weed species.
	<u>Inappropriate fire regimes</u> Hot fires that impact vegetation community structure and increase the likelihood of weed invasion after the initial reduction in groundcover.	Refer to *Table 12*: Fire – fire is not permitted in the offset area unless for fuel reduction purposes at no less than seven-year intervals and no more than 30% of the area in any year.

Document	Key threats	Section addressed in document
	Predation by feral animals including cats and foxes	Refer to *Table 12*: Feral animals – will be monitored and controlled. The presence of feral animals will be minimised and existing populations of feral animals (feral cats. dogs and pigs) controlled within the offset areas in accordance with the *Biosecurity Act 2014* (Qld). Major damage to the environment/habitat occurs when large numbers of animals congregate in the area.
	Illegal shooting	Refer to *Table 12*: Access – access by unauthorised personnel will not be permitted. Monthly inspections will confirm fences are preventing cattle and unauthorised people from accessing the offset area. The offset area is on a large privately owned agricultural property in a remote area (*Figure 2*) with access to the area restricted to the land managers.
Threat Abatement Plan for predation by feral cats. (2015) Department of the Environment, Canberra.	Predation by cats	Refer to *Table 12*. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area. Feral animals will be monitored and controlled as described in *Table 12*. The plan will minimise the presence of feral animals and control of existing populations of feral animals (feral cats, dogs and pigs) within the offset areas in accordance with the *Biosecurity Act 2014* (Qld). Monthly inspections will be conducted to record the presence of wallow holes, tracks and visual incidents in the offset area. Upon being notified or becoming aware of the presence of large numbers of feral animals in the offset area, the Landholder is to implement feral animal control measures within one month.
Threat Abatement plan for competition and land degradation by rabbits. (2016) Department of the Environment and Energy, Canberra.	Presence of rabbits	
Threat Abatement Plan for predation by the European red fox (2008) Department of the Environment, Water, Heritage and the Arts, Canberra.	Predation by foxes	

3 Impact site description

The Project area itself is located amongst a relatively well vegetated, although grazed, landscape amongst a number of protected areas, including Blackdown Tablelands National Park and Taunton National Park. Approximately 76 % of the Project area was covered with remnant or high value regrowth vegetation, dominated by eucalypt and wattle woodlands. Sand plains overlay a generally flat or gently undulating terrain in the east with low lateritic jump ups in the west, and outcrops. A number of shallow sandy incised alluvial channels dissect the Project area in a generally south-west to north-east direction towards Duckworth Creek in the north and Walton Creek in the east. The Project area exhibited evidence of regular and in some areas an intensive fire regime and was heavily grazed. Ongoing coal seam gas exploration activities were also evident in the area, with a number of cleared tracks and drill pads present.

The Project was commenced in December 2018 by the previous approval holder. At the time of the purchase by BCC, in November 2021, previous holders had commenced disturbance in all categories (*Figure 4*), including:

- the north section of the West Dump
- the north section of the East Dump
- mine infrastructure area and the run-of-mine pad
- sediment dams
- pit.

3.1 Ecological assessments

A post-wet season flora and fauna survey was conducted between 7 and 15 April 2013 and a pre-wet season flora and fauna survey was conducted between 8 and 17 September 2013. These surveys aimed to field-validate the type, distribution and remnant status of vegetation communities throughout the Project area. The timing of the post-wet season survey provided optimal conditions for the identification of flora species. Grasses and herbaceous species were all found to be bearing reproductive material due to good rainfall in the months preceding the field survey. No rainfall was experienced during or immediately prior to the dry season survey in September 2013.

3.1.1 Flora field survey methods

The field flora survey methods were developed in order to:

- validate existing Queensland Government-produced RE and high-value regrowth (**HVR**) vegetation mapping, and better define the distribution and proportionate composition of REs within mixed polygons of more than one RE type
- target significant flora species and communities (listed under Australian and Queensland Government legislation) and their habitats, which were identified from database searches
- produce a comprehensive floral inventory for each vegetation type and the Project area as a whole.

The Project area was surveyed in compliance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland, Version 3.2* (Neldner et al. 2012). Assessment sites were performed throughout the entire study area so as to thoroughly assess the Queensland Government-mapped remnant and HVR vegetation.

The validation and mapping of remnant and HVR vegetation was undertaken at a total of 81 vegetation assessment sites during the post-wet season survey. Multiple sites were conducted

within each RE type. Of the 81 assessment sites, 11 were conducted as detailed secondary sites, 20 as tertiary sites and 44 as modified quaternary sites. The less detailed sampling (tertiary and quaternary assessment sites) was conducted to provide additional information relating to the vegetative structure and to assist in mapping the extent and distribution of the identified REs within the study area. Six ecological equivalence sites were also conducted within each RE that is likely to be impacted by the footprint of the proposed Project.

Dry season surveys involved 7 additional assessment sites, 2 being tertiary and 5 modified quaternary sites. These additional sites were required to provide better site coverage and validate habitat in which threatened species were identified.

In total, 86 assessment sites were undertaken for the study area across both survey periods, comprising 11 secondary, 6 ecological equivalence monitoring, 22 tertiary and 47 quaternary sites. Detailed flora species lists were collated at all secondary and ecological equivalence monitoring sites. Due to the optimal conditions experienced during the field survey it is likely that the species list collated for the study area is an accurate reflection of the actual floristic diversity present.

3.1.2 Fauna field survey methods

A number of fauna survey techniques were employed to survey the fauna inhabiting the study area. The post-wet season fauna survey was undertaken from 7 to 14 April 2013, inclusive. Seasonal conditions during and preceding this survey were considered good for the detection of all groups of fauna. The dry season fauna survey was undertaken from 8 to 17 September 2013, inclusive.

A large variety of faunal survey methods were used, including the use of systematic trap sites, spotlighting, call playback, infrared cameras, active searching, supplementary survey sties, harp trap sites, Anabat survey sites and observation (e.g. bird surveys and opportunistic observations).

As a result of the detection of koala scats at one location during the post-wet season survey, targeted line transects were conducted in the study area during the dry season survey. In line with the *Interim Koala Referral Advice for Proponents* (SEWPaC 2012), 26 line transects were stratified across each of the field validated REs mapped within the study area to establish an estimate of population density, distribution and habitat preferences. The methodology employed for the line transects involved two ecologists walking a distance of 25 m apart for a length of 500 m on one side of a centreline and then returning along the other side of the 500 m centreline also remaining a distance of 25 m apart, while inspecting each tree along this transect. This results in a search area of 5 ha for each transect.

To determine an estimate of koala habitat trees within each RE, the number of koala habitat trees were counted by one observer within the first 100 m of each transect. This equates to a search area of 0.25 ha. The South East Queensland Koala State Planning Regulatory Provision definition of a mature koala habitat tree was used for this assessment, i.e. a tree of the genus of *Eucalyptus*, *Angophora*, *Corymbia*, *Melaleuca* and *Lophostemon* with a diameter at breast height of 100 millimetres or a height of greater than 4 m.

For trees where a koala or evidence of a koala was identified, the type of species of the tree and location were noted.

3.2 Biodiversity values of the impact site

Field validation of vegetation communities confirmed the presence of remnant and high value regrowth vegetation in the study area. Vegetation was mapped as remnant if it met the criteria defined under the VM Act. The vegetation communities were found to be relatively consistent with the current EHP mapping for the western half of the study area; however, field survey found a greater cover of remnant vegetation in the eastern portion than currently mapped by the EHP.

One additional RE 11.5.3 and a variation of RE 11.5.2, which have not previously been mapped in the study area were also identified.

A total of 634 ha of vegetation was validated as remnant vegetation, and 194 ha was validated as HVR. None of the vegetation communities identified within the study area are representative of a described threatened ecological community (**TEC**) listed under the EPBC Act. The field-validated REs within the study area were:

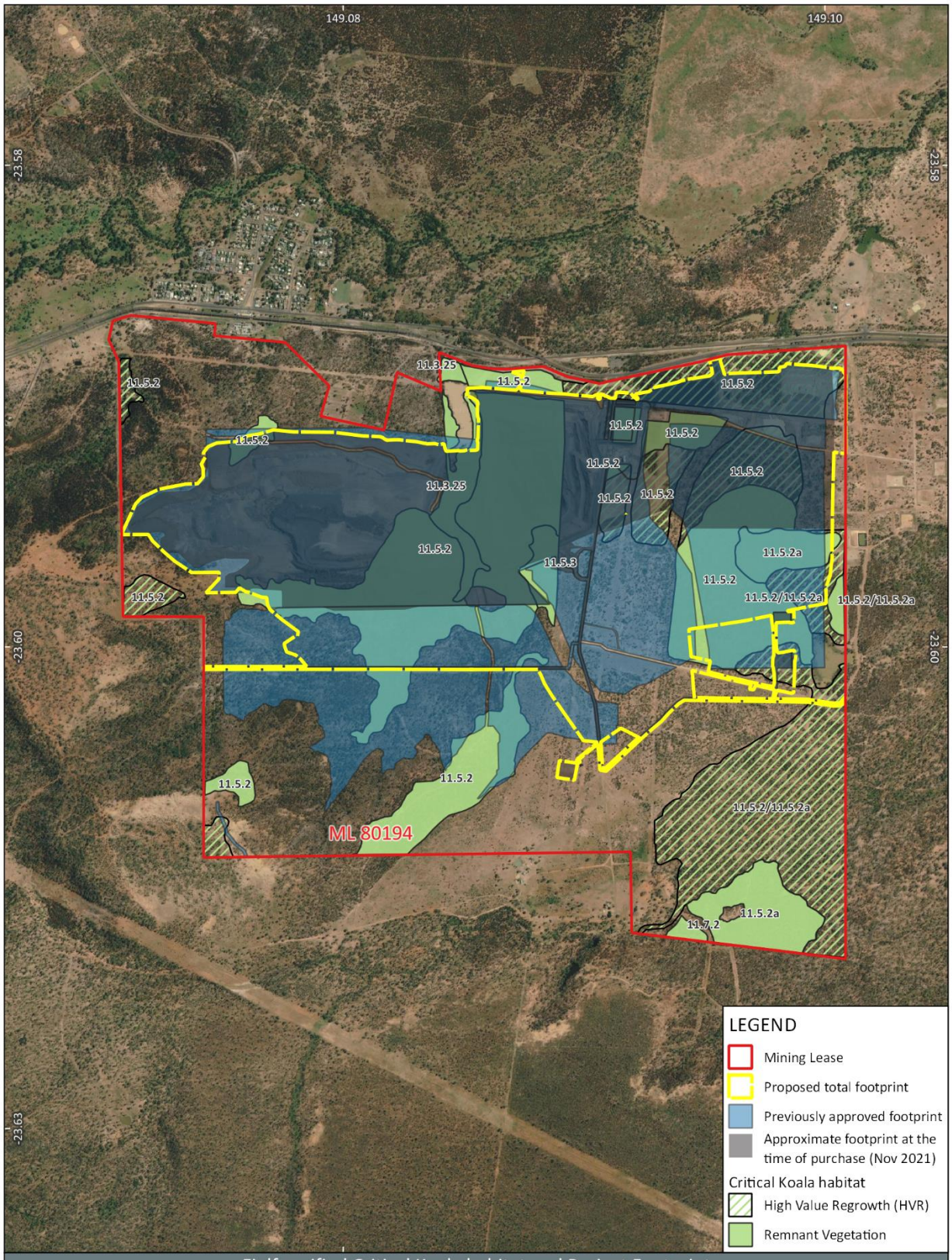
- RE 11.3.25 - Queensland blue gum (*Eucalyptus tereticornis*) or Queensland river red gum (*E. camaldulensis*) woodland fringing drainage lines
- RE 11.5.2 - Narrow-leaved ironbark (*Eucalyptus crebra*), *Corymbia spp*., with *E. moluccana* on lower slopes of Cainozoic sand plains/remnant surfaces
- RE 11.5.2a – Buloke (*Allocasuarina luehmannii*) low tree layer with or without emergent woodland
- RE 11.5.3 – Poplar box (*Eucalyptus populnea*) and/or silver-leaved ironbark (*E. melanophloia*) and/or Clarkson's bloodwood (*Corymbia clarksoniana*) on Cainozoic sand plains/remnant surfaces
- RE 11.7.2 - *Acacia spp*. woodland on lateritic duricrust; scarp retreat zone.

Presence of koala was confirmed through the recording of scats at 4 separate locations, all within remnant RE 11.7.2. No individuals of this species were recorded during the field surveys.

As defined in the approval conditions, the Critical Koala habitat means areas of vegetation found on the project area containing tree species known to be utilised for food or shelter and which are consistent with the Queensland Regional Ecosystems RE 11.3.25, RE 11.5.3, RE 11.5.2 and RE 11.5.2a. Critical Koala habitat within the Project is shown in *Figure 4.*

The detailed habitat quality assessment tables for the impacted koala habitat areas are provided at *Appendix B*.

Figure 4: Field-validated REs in the impact area



Fielf-verified Critical Koala habitat and Project Footprint

Bluff Coal Mine Project

Client	Bowen Coking Coal
Date	23-08-2023
Author	AARC Brisbane
Projection	GDA2020 / MGA zone 55
Scale	1:25000

0 0.4 0.8 1.2 km

ENVIRONMENTAL SOLUTIONS

Q:\Bowen Coking Coal\Bluff Coal Mine\20 Mapping Data\02 Workspaces_QGIS\Bluff impacts v2.qgz

Part B: Land Management Plan

4 Offset property

4.1 Overview of the offset property 'Colorado'

As described in Section 1.4, the property 'Colorado' is located adjacent to the east and south of the Project area and is owned by BCC. It is approximately 1,960 ha and is described as Lot 11 on H4023 and Lot 12 on H4035. Lot 11 on H4023 is partially within the ML and is partly affected by the Project footprint.

Land within the property is used predominantly for cattle grazing. Large parts of the property in the north-east (Lot 11 H4023) appear to have been subjected to both historic (late 1970's) and recent clearing for coal seam gas. On the southern portion (Lot 12 H4035), disturbance is limited to a large patch in the west. This disturbance potentially occurred over 30 years ago, but has altered the vegetation composition so that the area is not representative of any RE.

The property is suitable for locating the offsets for a number of reasons:

- The delivery of the offset will be adjacent to the impact site (*Figure 2*).
- The offset area is located within a corridor of State significance (*Figure 3*).
- The relevant field-verified biodiversity values are present on the offset property (*Figure 5*).
- The property management objectives align with the offset management objectives
- There is potential for the future location of other offsets on the same property for other projects, thus creating larger areas of biodiversity offsets and achieving a better environmental outcome.

In respect to the Queensland Government's koala conservation framework, Colorado is located in koala district C.[3] The offset area, when registered as a declared area under the VM Act, will give a higher level of protection to the species than that provided by the regulations that relate to koala district C.

Table 6 identifies the specific areas on Colorado that are suitable for each MNES being offset (see *Section 6* for further details).

Table 6: Regional ecosystems for MNES offsets on Colorado

	Koala	Squatter pigeon (southern) within the koala offset area
Regional ecosystem	11.5.2, 11.5.2a	Entire area

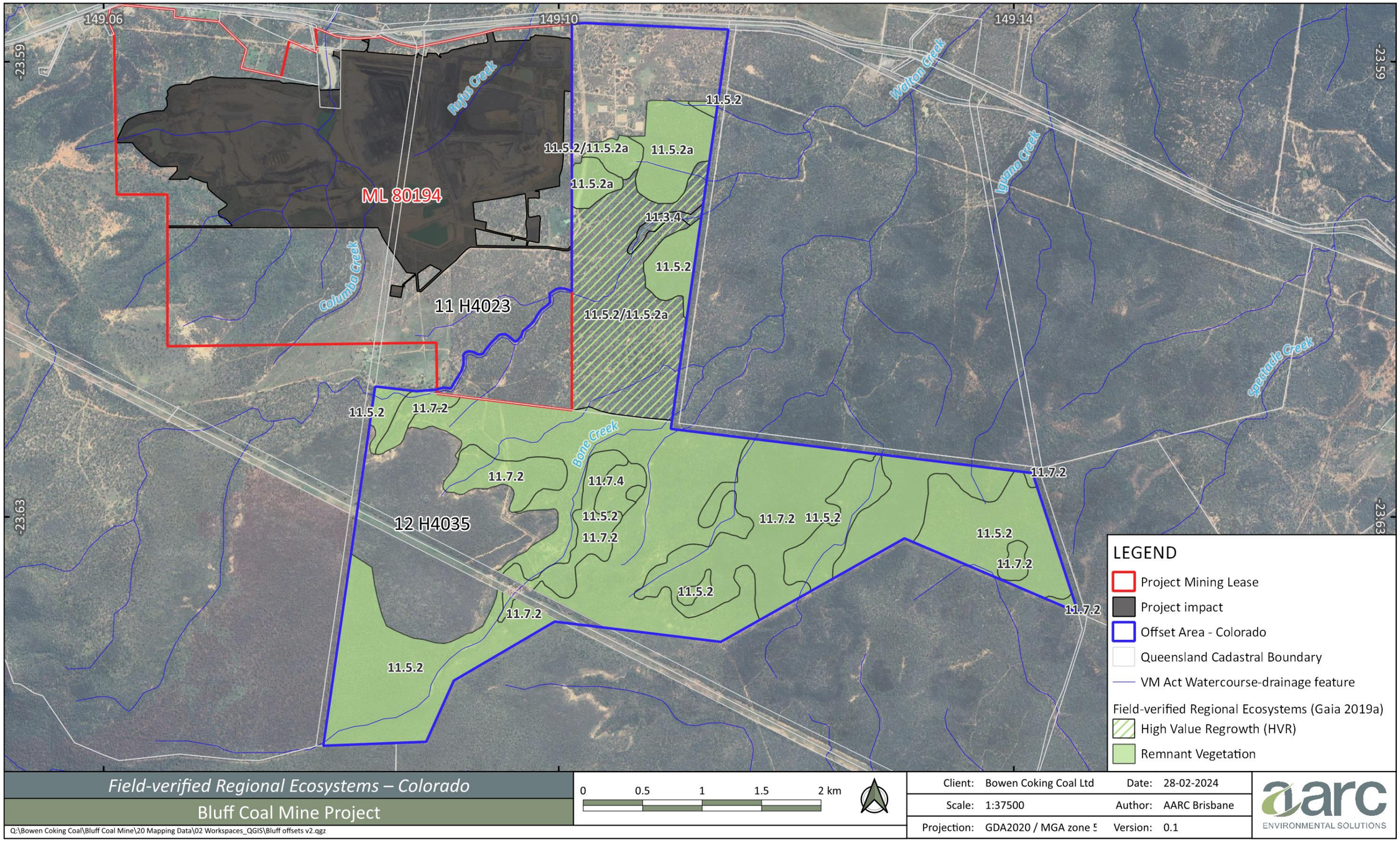
4.1.1 Connectivity

The property itself, in its entirety, forms part of a large regional landscape corridor. This corridor is recognised in the Queensland Government Biodiversity Planning Assessment Mapping and links the important refuges of the Arthurs Bluff State Forest, Walton State Forest, Blackdown Tableland National Park and Taunton National Park. Bone Creek and Walton Creek, which dissect the proposed offset property, reinforce this connectivity. Although the condition of vegetation along these waterways is threatened by weed invasion, these waterways are likely to play a role in

[3] Queensland Government (2021). Information Sheet – Nature Conservation (Koala) Conservation Plan 2017, Planning Regulation 2017, Queensland Environmental Offsets Policy.

maintaining landscape connectivity, particularly with the long-term benefit brought by the implementation of the offset management actions (see *Section 8*).

Figure 5: Field-verified regional ecosystems – Colorado



5 Offset site biodiversity values

5.1 Site assessment methodology to determine ecological values

Preliminary desktop assessment

A desktop assessment was undertaken to identify ecological values potentially occurring within or the study area, including records for MNES. The desktop assessment included a review of literature and searches of publicly available datasets and online mapping.

The following databases and ecological documents were reviewed as part of this assessment:

- DCCEEW EPBC Act Protected Matters Search Tool, to identify MNES relevant to flora within a search area extending at least 10 km from the offset property.
- The Queensland Department of Environment and Science (**DES)** Wildlife Online search results for endangered, vulnerable, and near-threatened (**EVNT**) species records and special least concern (**SLC**) species records within a search area extending at least 30 km from the offset property (DES 2019).
- Queensland Herbarium records search for EVNT and SLC species records within the Australian Virtual Herbarium.
- Atlas of Living Australia for EVNT and SLC species records.
- Remnant RE mapping (Version 10.1) for the offset property to identify vegetation communities that are likely to occur.
- Broad vegetation groups - pre-clearing and 2017 remnant (Version 4.0) (DES 2017).
- DES essential habitat mapping (Version 7.19) to identify vegetation in which an EVNT species has been known to occur.

Field survey work

Surveys were conducted in late summer from 5 to 14 February 2019. Climatic conditions in the lead-up to the surveys were well suited to both flora and fauna survey. Conditions at the time of the survey, as inferred from weather data captures at the Bureau of Meteorology weather station at Blackwater (26 km away), were 22–36° C (average min–max temperature) and 4.2 mm rain (rainfall over survey period). The full survey report is provided at *Attachment 1B*.

The field surveys were undertaken in accordance with the following relevant survey guidelines:

- *Queensland Flora Survey Guidelines – Protected Plants* (Queensland Department of Environment and Heritage Protection (**DEHP**) 2016)
- *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland Version 4.0* (Neldner et al. 2017)
- *Guide to Determining Terrestrial Habitat Quality* (DEHP 2017).

Field surveys were undertaken to confirm the identity of REs and to conduct searches for EVNT flora species across the study area. Terrestrial habitat quality assessments were only undertaken in areas identified in the desktop assessment as potentially suitable as an offset.

Aerial imagery and State RE mapping (Version 10.1) were used to identify 68 sites for the assessment of vegetation communities and habitat quality. Site selection aimed to capture numerous representations of each mapped RE within the offset investigation area (**OIA**) as well as adequate spatial separation of sites. Mixed polygons were also targeted to enable identification and separation of constituent REs. The location of some survey sites was refined in the field to capture the most representative datasets. The assessment of vegetation units used

quaternary level site assessments to ground-truth RE polygons in accordance with Neldner et al. 2017.

Vegetation communities were assessed at a total of 68 sites. This included 20 Quaternary level sites and 28 Tertiary level sites and 20 terrestrial habitat quality (**THQ**) sites. The assessments were undertaken in accordance with the Queensland Herbarium vegetation survey methods described in Neldner et al. (2017). Survey sites were undertaken within representative communities and as vegetation community types transitioned to aid vegetation mapping and interpretation.

Tertiary level flora assessments were undertaken to confirm the identify of REs and assist in field-verifying the RE boundaries. The following information was recorded at these sites:

- confirmation of the RE
- structural characteristics of the vegetation (based on life forms, strata, height and cover)
- relative abundance of each species (dominant, abundant, frequent, occasional or rare)
- groundcover characteristics
- vegetation condition (integrity as either pristine, excellent, very good, good, average, degraded or completely degraded)
- presence and abundance of weeds of national significance (**WoNS**) and restricted weeds
- presence and population characteristics of EVNT flora
- landscape characteristics
- regolith characteristics, including erosion
- wetland characteristics (if present).

Quaternary level flora assessments were undertaken to confirm the identity of REs and assist in field-verifying the RE mapping boundaries. The following information was recorded at these sites:

- the dominant and characteristic canopy, mid-storey and understorey species
- relative abundance measured as dominant, abundant, frequent, occasional or rare)
- field-verified RE
- vegetation condition (integrity as either pristine, excellent, very good, good, average, degraded or completely degraded)
- presence and population characteristics of EVNT flora
- presence and abundance of WoNS and restricted weeds
- other notes of relevance, such as community characteristics (size of community), site features (gullies) or evidence of disturbance.

Targeted flora surveys were not undertaken within the OIA, but flora species were noted at each survey site.

Baseline offset fauna surveys were targeted at the threatened fauna species of koala and squatter pigeon (southern). The aim of the baseline offset surveys is to confirm the presence of the target threatened fauna species and/or supportive habitat in the OIA. The field surveys were undertaken in accordance with the following relevant survey guidelines:

- *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland* (Eyre et al. 2014)
- *EPBC Act survey guidelines for Australia's threatened birds* (DEWHA 2010)
- *EPBC Act Referral Guidelines for the Vulnerable Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory)* (DoE 2014)
- *Guide to Determining Terrestrial Habitat Quality* (DEHP 2017).

Targeted fauna surveys were undertaken across the OIA. THQ assessments were undertaken to evaluate target fauna habitat (in accordance with the *Guide to Determining Terrestrial Habitat*

Quality (DEHP 2017)) in areas identified from the desktop assessment as being potentially suitable as an offset.

A total of 20 terrestrial habitat quality assessments were completed in the OIA. The *Guide to Determining Terrestrial Habitat Quality* (DEHP 2017) forms the basis of the methodology for sampling of THQ across the OIA and can be referenced for a detailed description of the methodology. Habitat quality is assessed through a strategic combination of indicators that measure the overall viability of the site and its capacity to support a prescribed environmental matter. The three key indicators for determining habitat quality of a land-based impact or offset site are:

1. site condition: a general condition assessment of vegetation compared to a benchmark
2. site context: an analysis of the site in relation to the surrounding environment
3. species habitat index: the ability of the site to support a species.

The final HQS measured for each site/assessment unit involves adding the scores for 'site condition', 'site context' and 'species habitat index' (if applicable). This score is then compared to the HQS (maximum), which is the highest score that the assessment unit could achieve if it was in optimum condition. For this OIA the maximum score for REs is 106 and the maximum score for fauna habitat is 156. Each site's habitat quality score contributes to an average score for each assessment unit and is converted to a score out of 10. For each assessment unit (or RE type), the assessment unit area (in ha) is divided by the total offset site area (in ha) to find the size weighting for that assessment unit. Then each assessment unit habitat quality score is multiplied by its size weighting.

5.2 General description and vegetation habitat values

Large parts of the property in the north-east (Lot 11 H4023) appear to have been subjected to both historic and recent clearing for coal seam gas. On the southern portion (Lot 12 H4035), disturbance is limited to a large patch in the west. The most degraded REs on the property are those belonging to the eucalypt dry woodlands on inland depositional plains (broad vegetation group (**BVG**) 5 (1:1 million)), with all areas of disturbance limited to this BVG. However, the REs that form BVG 5 (including RE 11.5.2) are also the most widely distributed REs in the locality.

The BVGs (BVG 1:1 million) within the property (in order of dominance) are:

- BVG 5 – Eucalypt dry woodlands on inland depositional plains
- BVG 10 – Acacia dominated open forests, woodlands and shrublands; and
- BVG 3 - Eucalypt woodlands to open forests.

Within the area of BVG 5 (875.5 ha), the following REs were recorded:

- 11.5.2 - *Eucalyptus crebra*, *Corymbia spp*., with *E. moluccana* woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces
- 11.5.2a - *Allocasuarina luehmannii* low tree layer with or without emergent woodland.

The area of BVG 10 (288 ha) was comprised of RE 11.7.2 - *Acacia spp*. woodland on Cainozoic lateritic duricrust (scarp retreat zone).

The area of BVG 3 is the most limited on the property, made up of an area of 13 ha of RE 11.7.4 - *Eucalyptus decorticans* and/or *Eucalyptus spp*., *Corymbia spp*., *Acacia spp*., *Lysicarpus angustifolius* woodland on Cainozoic lateritic duricrust.

Field verified RE mapping undertaken following the February 2019 fieldwork demonstrates that approximately 950 ha of the property is remnant vegetation, with all remnant vegetation being classed as 'of least concern' REs. The distribution of State-mapped remnant vegetation was largely comprised of REs 11.5.2 and 11.7.2; however, the spatial boundaries of these two vegetation types required refinement to better align with the actual on-ground distribution.

Further, three patches of remnant vegetation in the northern portion of the investigation area, which are currently mapped as either RE 11.5.2 or RE 11.7.2, are more representative of RE 11.5.2a due to the dominance of buloke (*Allocasuarina luehmannii*). The distribution of RE 11.7.4 was much less prolific than currently mapped due to the lower frequency of eucalypt woodlands subsisting on lateritic surfaces.

A portion of the property is affected by regrowth native vegetation of varying ages and quality (approximately 174 ha). Field investigations were undertaken to identify the vegetation communities within significant patches of regrowth. Areas of regrowth mapped comprised those areas where regeneration of woodland would be expected to reach species composition, height and cover characteristics of remnant vegetation in a period of no greater than 20 years. It was noted that all areas of regrowth had high levels of weediness, and would benefit from management.

Three mixed polygons are mapped within the Colorado area, in remnant and regrowth vegetation, consistent on 11.5.2 (90%) and 11.5.2a (10%). The vegetation within the offset area has been mapped following the. According to the 'Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland Version 4.0 (Neldner et al 2017)', there is a minimum size limit for vegetation mapping, regardless of the scale of the mapping. When a polygon has more than one vegetation type (regional ecosystem), and some are too small to be individually mapped, the polygon is mapped as a heterogenous polygon, indicating the percentage of each vegetation type. Due to the small percentage of the secondary vegetation type scattered within the total area, which is 100% core Koala habitat, the Offset site ecology report considers the dominant vegetation at both heterogeneous polygons as the only vegetation type. The BOMP report has followed the same approach.

Approximately 357 ha of land within the property is not associated with any regulated vegetation. The field-verified mapping showing the distribution of REs across remnant and regrowth vegetation is shown at *Figure 5*.

Signs of the presence of koala were recorded within the property during the field surveys conducted in February 2019 through the observation of scats and scratches. No individuals were observed during the targeted species surveys.

The squatter pigeon (southern) was identified on one occasion (several individuals) on the edge of regrowth vegetation near the coal seam gas field in the north of the property.

6 Offset site start values

The results of the habitat quality assessments of the two different vegetation structures (remnant and regrowth) and the various assessment units that occur within the offset areas are detailed within the field data sheets that are provided within the ecology reports (see *Attachment 1.2*) and were transcribed into the Offset Assessment Guide (DCCEEW) (**OAG**). The detailed habitat quality assessment tables are provided at *Appendix B*.

Figure 6 provides a detailed map of the proposed offset area for koala. *Figure 7* identifies the extent of squatter pigeon habitat within the koala offset area, being the entire area. The quantum of the offset area has been determined utilising agreed outputs from the DCCEEW OAG.

6.1 Koala

The koala is a medium-sized marsupial with a stocky body, large, rounded ears, sharp claws and variable but predominantly grey-coloured fur. Males are typically larger than females. Its morphological appearance changes gradually from south to north across its range, with larger individuals in the south and smaller individuals in the north. The average weight of males is 12 kilograms in Victoria compared with 6.5 kilograms in Queensland. In the south, the koala is characterised by longer, thicker, brown-grey fur, whereas in the north it has shorter, silver-grey fur (Martin & Handasyde 1999).

The population of the listed koala has a wide but patchy distribution that spans the coastal and inland areas of Queensland north to the Herberton area, extending westwards into hotter and dryer semi-arid climates of central Queensland, NSW and the ACT. Koalas in Queensland inhabit the moist coastal forests, southern and central western subhumid woodlands, and a number of eucalypt woodlands adjacent to waterbodies in the semi-arid western parts of the state (Melzer et al. 2000). In many locations, koala populations are of low density, widespread and fragmented (Melzer et al. 2018). Surveys in north-western Queensland found that koalas were patchily distributed, associated with creek-lines, areas of higher tree species richness, with higher abundance correlating with leaf-moisture content (Munks et al. 1996).

The natural range of the koala is determined by specialist food, habitat and environmental requirements. Typically, this includes forests and woodlands dominated by eucalyptus species (Melzer et al. 2000). The koala's home range (the area an individual needs to survive) is highly variable and dependant on life history stage, soil fertility, habitat quality and nutritional requirements. Consequently, home ranges across the species' distribution are highly variable, with home ranges in Queensland reported to vary between 3 and 500 ha (Wilmott 2020).

6.1.1 Koala – offset site attributes

In the Colorado property, signs of koala were noted along Walton Creek and Bone Creek associated with scattered blue gums (*Eucalyptus tereticornis*). As per the Conditions of Approval, potential koala habitat within the OIA is located within the areas of eucalypt dry woodlands on inland depositional plains (RE 11.5.2) and the *Allocasuarina luehmannii* low tree layer with or without emergent woodland (RE 11.5.2a).

Terrestrial habitat quality assessments for potential koala habitat indicates an average score of 5 for remnant habitat and 4 for regrowth. There were 13 sites assessed including 8 in RE 11.5.2, two in RE 11.5.2a, and one in regrowth RE 11.5.2. The total area of potential habitat is 875.5 ha (including 207.6 ha of regrowth). The complete terrestrial habitat quality assessments are shown in *Attachment 1B*. The habitat quality assessment results for the koala offset area are summarised in *Table 7*. The detailed habitat quality assessment tables are provided at *Appendix B*. The offset area for koala is shown in *Figure 6*.

Figure 6: Koala offset area – Colorado

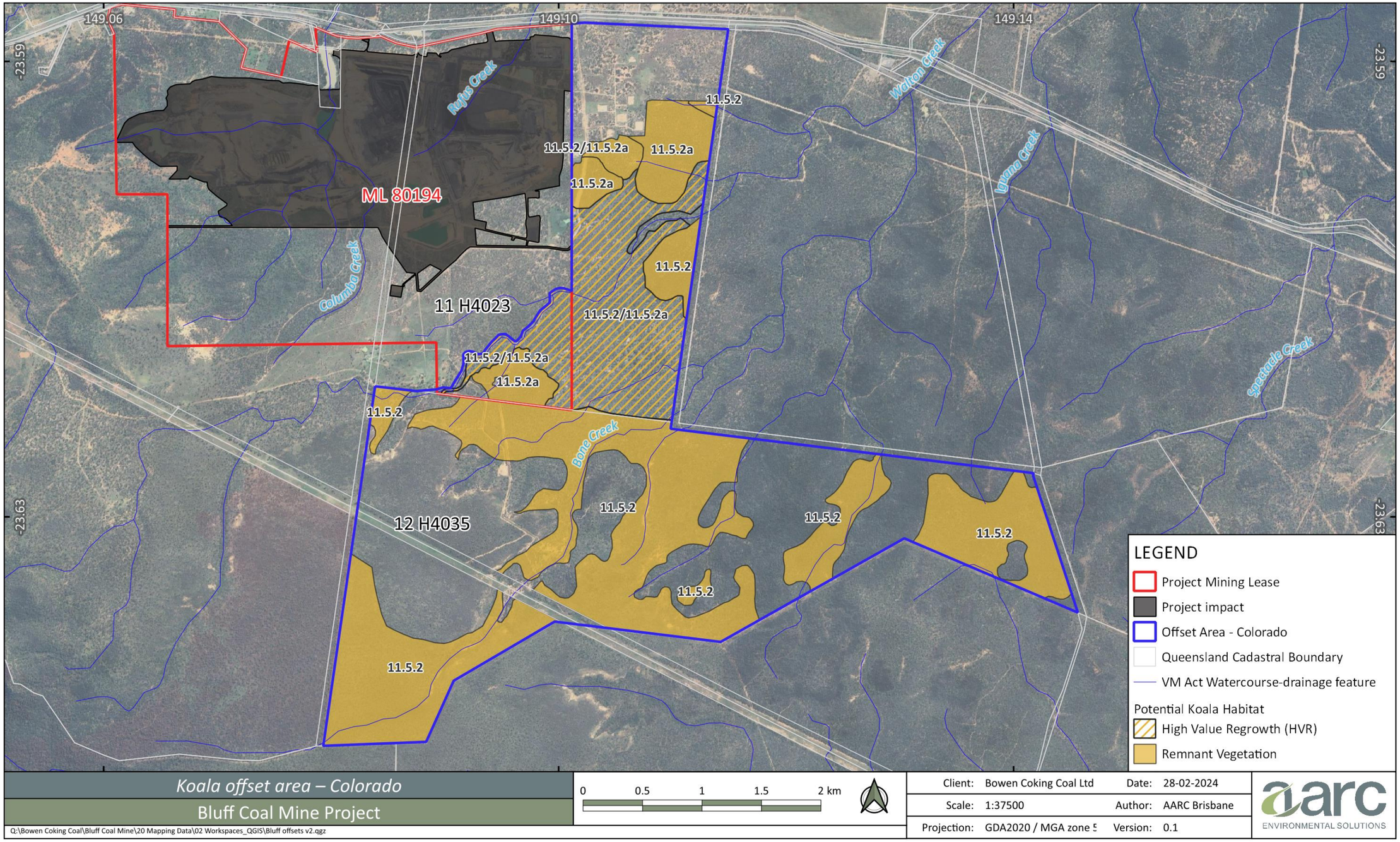


Table 7: Koala area habitat quality assessment results

Regional ecosystem	Description	Assessment sites	Polygons	Vegetation condition score	Start habitat quality score	Area (ha)	Regulated vegetation?	Contribution to offset area as a % of the final area (ha)
11.5.2	*Eucalyptus crebra*, *Corymbia* spp., with E. *moluccana* woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	8		62.13	5	586.3	Y	67.0
11.5.2 high-value regrowth		2		56.25	4	207.6	N	23.7
11.5.2a	*Allocasuarina luehmannii* low tree layer with or without emergent woodland	2		63.75	5	81.5	Y	9.3
						875.5		**100.0%**

6.2 Squatter pigeon (southern)

The squatter pigeon (southern) is a medium-sized, ground-dwelling pigeon that measures approximately 30 centimetres in length and weighs about 190-250 grams. Adults are predominantly grey-brown, but have black and white stripes on the face and throat, blue-grey skin around the eyes, dark-brown (and some patches of iridescent green or violet) on the upper surfaces of the wings, blue-grey on the lower breast and belly, white on the lower region, flanks of the belly and extending onto the under surfaces of the wings, and a blackish-brown band along the trailing edge of the tail. They have black bills, dark-brown irises, and dull-purple legs and feet. The sexes are similar in appearance (Higgins & Davies 1996).

In Queensland, squatter pigeon (southern) foraging and breeding habitat is known to occur on well-draining, sandy or loamy soils on low, gently sloping, flat to undulating plains and foothills (i.e. Queensland RE land zone 5), and lateritic (duplex) soils on low 'jump-ups' and escarpments (i.e. Queensland RE land zone 7) (Squatter Pigeon Workshop 2011). Recent evidence suggests that the squatter pigeon also breed within recent Quaternary alluvial systems (i.e. Queensland RE land zone 3) (Squatter Pigeon Workshop 2011).

6.2.1 Squatter pigeon (southern) – identified habitat area attributes

The squatter pigeon (southern) was identified on one occasion (several individuals) on the edge of regrowth vegetation in the north of the OIA. Utilising this information, potential squatter pigeon habitat within the OIA is located within the areas of eucalypt dry woodlands on inland depositional plains (REs 11.5.2 and 11.5.2a). Based on these REs being suitable habitat for squatter pigeon, as discussed above, all of the koala offset area as described in *Section 6.1* can also be identified as squatter pigeon habitat.

Accordingly, and in keeping with approval condition 7. b), the extent of squatter pigeon habitat identified within the koala offset area is 875.5 ha.

The habitat quality assessment results for the squatter pigeon offset area are summarised in *Table 8*. The squatter pigeon habitat identified within the koala offset area is shown in *Figure 7* (being the entire offset area).

Figure 7: Squatter pigeon (southern) habitat within the koala offset area

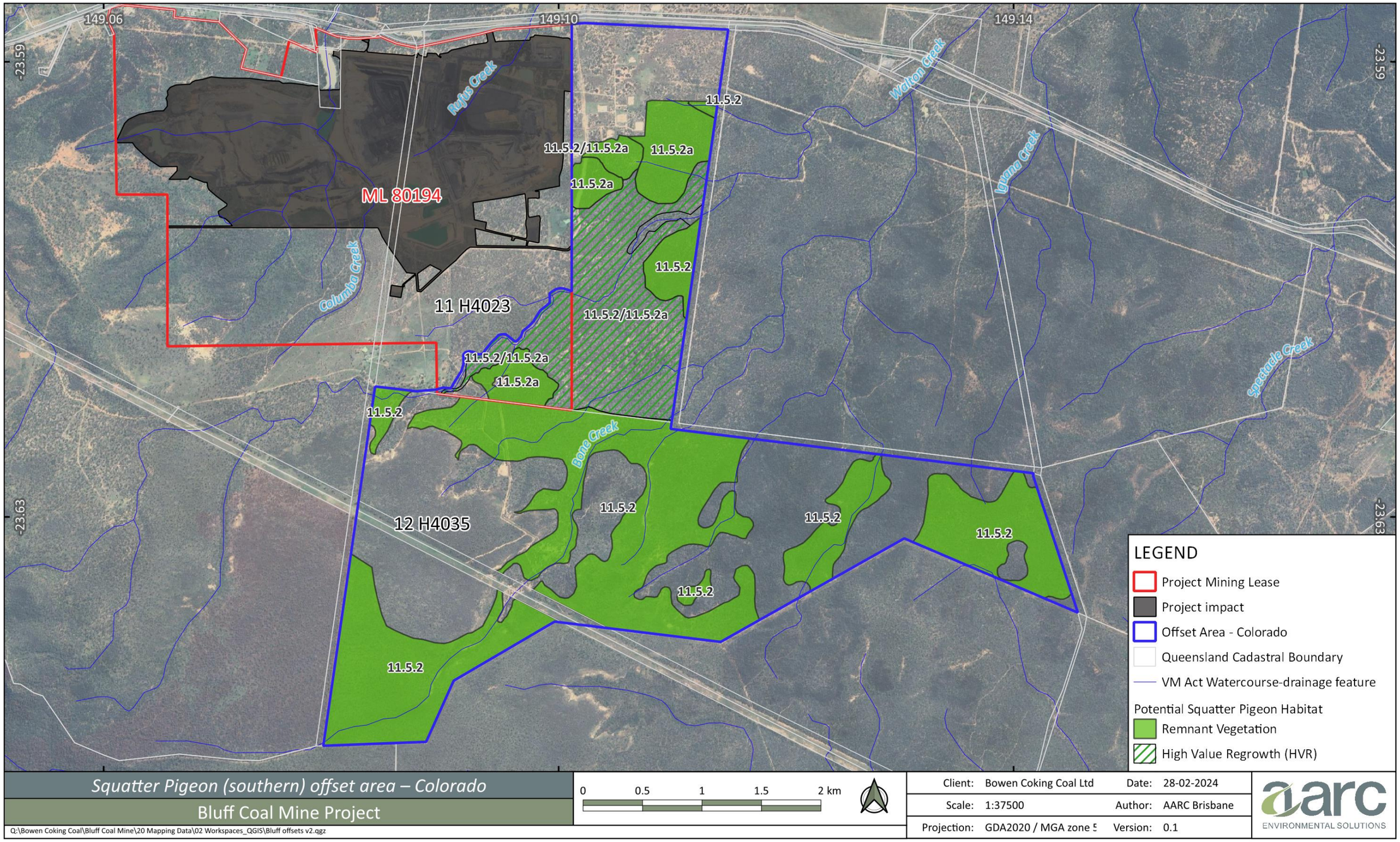


Table 8: Squatter pigeon (southern) offset area habitat quality assessment results

Regional ecosystem	Description	Assessment sites	Polygons	Vegetation condition score	Start habitat quality score	Area (ha)	Regulated vegetation?	Contribution to offset area as a % of the final area (ha)
11.5.2	*Eucalyptus crebra*, *Corymbia* spp., with *E. moluccana* woodland on lower slopes of Cainozoic sand plains and/or remnant surfaces	8		62.13	5	586.3	Y	67.0
11.5.2 high-value regrowth		2		56.25	4	207.6	N	23.7
11.5.2a	*Allocasuarina luehmannii* low tree layer with or without emergent woodland	2		63.75	5	81.5	Y	9.3
						875.5		**100.0%**

6.3 Offset area start values

The results of the habitat quality assessments of the different vegetation community assessment units that occur within the offset areas are summarised in *Table 7* and *Table 8*. The field data sheets are provided within the ecology reports (see *Attachment 1B*). The detailed habitat quality assessment tables are provided at *Appendix B*.

A detailed map of the offset area for koala is shown at *Figure 6.* The koala offset area has been determined utilising outputs from the DCCEEW OAG. The full OAG output for koala is shown at *Appendix A*. The inputs used in the OAG for each of remnant and regrowth vegetation, to calculate the area required for the offset area, are outlined in *Table 9*.

Figure 7 shows the extent of identified squatter pigeon habitat within the offset area.

Table 9: Offset Assessment Guide inputs for koala

Attribute	Koala	
EPBC status	Vulnerable	
Vegetation status	Remnant	Regrowth
Impact area (ha)	248.94	
Impact quality	6	
Time until ecological benefit	20	
Start area (hectares)	667.8	207.6
Start quality (scale of 0-10)	5	4
Future quality without offset (scale of 0-10)	5	4
Future quality with offset (scale of 0-10)	7	
Risk of Loss (ROL) without offset %	8	
Confidence in ROL Result (%)	100	
Confidence in Condition Result (%)	85	
% of impact offset	**119.6**	

7 Analysis of risks to achieving management objectives and offset completion criteria

Potential risks to achieving the management objectives and outcomes have been considered in the plan (*Table 11)*. They have been assessed against the risk matrix (*Table 10*) that was supplied by DCCEEW. The risk matrix has been used to assess the risk that the plan's objectives will not be met and identify the sources of those risks and strategies for managing them.

The risk assessment:

a) identified events that will, may, or are likely to impact the attainment of the completion criteria
b) assessed the likelihood and consequences of those events, and characterises residual risk levels, taking into consideration the mitigation of the risk by implementing the management actions
c) identified the level of uncertainty in mitigating the risk with the management actions and trigger criteria and corrective actions until the risk is reduced to an acceptable level.

Table 10: Risk matrix

RISK MATRIX	
Qualitative measure of likelihood (how likely is it that this event/circumstances will occur after management activities are implemented)	
Highly likely	Is expected to occur in most circumstances
Likely	Will probably occur during the life of the project
Possible	Might occur during the life of the project
Unlikely	Could occur but considered unlikely or doubtful
Rare	May occur in exceptional circumstances
Qualitative measure of consequences (what will be the consequence/result if the issue does occur)	
Minor	Minor incident of environmental damage that can be reversed (*e.g. short-term delays to achieving plan objectives, implementing low-cost, well-characterised corrective actions*)
Moderate	Isolated but substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. short-term delays to achieving plan objectives, implementing well-characterised, high-cost/effort corrective actions*)
High	Substantial instances of environmental damage that could be reversed with intensive efforts (*e.g. medium-long term delays to achieving objectives, implementing uncertain, high-cost/effort corrective actions*)
Major	Major loss of environmental amenity and real danger of continuing (*e.g. plan objectives are unlikely to be achieved, with significant legislative, technical, ecological and/or administrative barriers to attainment that have no evidenced mitigation strategies*)
Critical	Severe widespread loss of environmental amenity and irrecoverable environmental damage (*e.g. plan objectives are unable to be achieved, with no evidenced mitigation strategies*)

		Consequence				
Likelihood		**Minor**	**Moderate**	**High**	**Major**	**Critical**
	Highly Likely	Medium	High	High	Severe	Severe
	Likely	Low	Medium	High	High	Severe
	Possible	Low	Medium	Medium	High	Severe
	Unlikely	Low	Low	Medium	High	High
	Rare	Low	Low	Low	Medium	High

Table 11: Risk assessment for the terrestrial offset sites

Note: The risk ranking codes relate to the risk matrix as follows: L = Likelihood C = Consequence R = Risk

Risk	Threats	Initial risk ranking			Management measures	Management measures/actions	Residual risk ranking		
		L	C	R			L	C	R
Force majeure events									
Mining of the offset site	No current permits cover the proposed offsets site. Open cut mining may produce full clearing of the offset site.	Rare	Critical	High	Offset area management	No current exploration or production permits cover the offset sites. The legal security over the site makes it known that the area is an offset. No available legal mechanism would render mining impossible on the offset site, however the declared area under the VM Act would significantly increase offset obligations upon any person proposing to impact the offset site.	Rare	Critical	High
Drought	The threat posed by drought is a decrease in DMY and groundcover, an increase in the likelihood of unplanned fire due to the dry conditions that could be started by lightning strike during storms and an increase in weed cover when rainfall was received. There would also be lower levels of growth expected.	Likely	Moderate	Medium	Offset area management Grazing management	Cattle will be excluded from the offset area during times of drought. Limited mitigation measures can be implemented. Should the offset be deemed by the approval holder or the Department to be delayed due to drought, both parties will work together to determine an appropriate response.	Likely	Moderate	Medium
Cyclones/ severe tropical lows/ flooding	The most significant impact from tropical cyclones or tropical lows is typically flooding. Systems generally form between November and April.	Likely	Moderate	Medium	Offset area management	Limited mitigation measures can be implemented. The offset areas on Colorado are in elevated parts of the landscape that do not experience flooding. Localised creek flows overtopping the banks would be the only impact for short periods of time. Wind damage to bigger trees would be expected to be the largest impact. However, cyclones and/or severe tropical lows are relatively infrequent (though likely to occur at some point during the life of the approval). However, flooding is not expected to be of sufficient duration, and winds are not expected to be sufficiently severe, to cause substantial long-term harm to the site. Additionally, the increased availability of soil moisture following extreme weather events is expected to increase growth rates, likely assisting natural repair of any potential damage. Increased soil moisture may assist weed growth, so a meander survey across the entire site will occur as soon after the end of a cyclone and any associated flooding as is safe and reasonably practicable to detect any areas of increased weed density. Flooding may also contribute to erosion (see below).	Likely	Minor	Low
Degradation of habitat or vegetation loss through land clearing									
Degradation of habitat	The degradation of habitat due to the lack of environmental management of the offsets area including appropriate grazing regimes, invasive plant control, fire management, and/or infrastructure maintenance.	Possible	High	Medium	Offset area management Grazing management	Implementation of the management actions and adaptive management framework as outlined in this BOMP	Unlikely	Minor	Low
Erosion	Raindrops hit bare soil with enough force to break the soil aggregates. These fragments wash into soil pores and prevent water from infiltrating the soil. Water then accumulates on the surface and increases runoff which takes soil with it.	Highly likely	Minor	Medium	Offset area management Grazing management	The expected severity of erosion at this site may occur due to the topography of the site. However, that risk can be further reduced by decreasing stock movement in the Offset Area and maintaining a dry matter yield (**DMY**). DMY of at least 500kg/ha will be maintained at all times and stock will be removed from the offset site before that minimum level would be breached.	Possible	Minor	Low

Risk	Threats	Initial risk ranking L	C	R	Management measures	Management measures/actions	Residual risk ranking L	C	R
Timber harvesting/ collection	Unauthorised access to the offset area may result in timber harvesting/collection Such actions would delay the establishment of the TEC.	Unlikely	Moderate	Low	Offset area management Site access control	Complete the installation of signage at all vehicle access points identifying the areas as an environmental offset, within six months of the approval of this BOMP. Complete the installation of any new planned fences, within twelve months of the approval of this BOMP. All field monitoring (rapid and detailed) will report on any evidence of timber harvesting.	Rare	Moderate	Low
Unplanned clearing	The offset site occurs within Colorado, a property that is used for cattle production. It is possible for unplanned / illegal clearing for agriculture activities but considered improbable as the offset site will be mapped as Category A on the property map of assessable vegetation (**PMAV**). Clearing can also occur by vehicles traversing the area off designated roads/tracks and/or illegal camping. This is also considered improbable, as the site is remote and access to the site will be restricted. The most plausible (though still unlikely) cause of unplanned/illegal clearing would be if aerial spraying on adjacent properties strayed across the offset boundary.	Unlikely	Major	High	Offset area management Site access control	Complete the installation of signage at all vehicle accesses identifying the areas as an environmental offset, within six months of the approval of this BOMP. Complete the installation of any new fences, within twelve months of the approval of this BOMP. Within six months of the approval of this BOMP, register a declared area over the Offset Site, ensuring it is shown as Category A vegetation on the PMAV. All monitoring (rapid and detailed) will report on any evidence of clearing.	Rare	Major	Medium
Fire: the impact from uncontrolled fire would be a reduction in groundcover, thinning of the canopy and slowing of the offset site achieving the completion criteria									
Unplanned or non-controlled fire in offset area.	The impact from uncontrolled fire would be a reduction in DMY and overall groundcover, thinning of the canopy, destruction of regrowth and emerging saplings and an overall slowing of the offset site achieving the completion criteria.	Likely	Moderate	Medium	Fire management	The Colorado offset site is largely comprised of remnant eucalypt species circa 12-22m in height. These communities are adapted to fire and the risk of a 100% loss is low due to lower DMY (fuel load) within the communities that are further managed with grazing.	Possible	Minor	Low
Increased fire risk due to high fuel loads	During periods when a low-level grazing regime has occurred and an average or above average wet season, there is an opportunity for fuel loads in the form of dry matter to accumulate to unacceptable levels. When this occurs and the high levels of fuel are present prior to summer, then the risk of wild and/or high-intensity fires is exacerbated.	Possible	High	Medium	Fire management	When DMY reaches 1,800 kg/ha, the fuel load is to be reduced via grazing to reduce DMY to no less than 500 kg/ha. In the offset area, a cold fire is only to be used at >7 -year intervals during the months of June, July, August and September, when wind speeds are less than 5km/h on the offset site.	Unlikely	Minor	Low
Invasive plants: introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the* Biosecurity Act 2014 *(Qld)									
New infestations of invasive weed species in the offset area.	Infestation of previously unidentified invasive weeds within the offset area. If a weed infestation is unchecked, it may cause a significant deterioration in the offset site.	Possible	High	Medium	Invasive plants management listed under the *Biosecurity Act 2014* (Qld)	The offset site on Colorado is remote and access to the offset area will be limited, to reduce/prevent pathogen/propagule transmission vectors. All vehicles accessing the offset area are required to have undergone a weed inspection and vehicle hygiene check, confirming that they are weed free, before accessing the site. If a new weed infestation is identified, weed management measures will occur as per *Table 12.*	Unlikely	Minor	Low
Expansion of existing infestations of declared weed species in the offset area	The extent of existing infestations of restricted invasive plants species expand or the species become more abundant within the area.	Highly likely	High	High	Invasive plants management listed under the *Biosecurity Act 2014* (Qld)	Access to the offset area will be restricted. Chemical and/or mechanical control of all restricted invasive plants in accordance with the control measures outlined in the Biosecurity Queensland Fact Sheets or other sources of information.	Unlikely	Minor	Low

Risk	Threats	Initial risk ranking L	C	R	Management measures	Management measures/actions	Residual risk ranking L	C	R
Pest/feral animals in the offset area									
Increased population of feral animals in the offset area.	Wild cat, pig and dog populations are extensive and highly transient, and therefore the scale of impact is potentially large. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area.	Highly likely	High	High	Pest animal management Feral pig management	Current control of pigs and wild dogs is undertaken via a baiting program on the property. This is augmented with shooting and trapping of wild pigs, when pest animal numbers increase. Additionally, the Pastoral Manager, during quarterly inspections of the offset area may remove any wild cats, pigs or wild dogs that are seen. If an increase in pig or dog activity is noted, an additional trapping, baiting and/or control program is to be instigated until the increased activity has ceased.	Possible	Minor	Low
Degradation of habitat by overgrazing									
Unauthorised or inappropriate grazing in offset area	High density grazing over an extended period destroys shrubs and native grass cover and slows the regeneration of habitat. The natural condition of the native ground cover is a low cover and hence any grazing undertaken is to reduce exotic grass cover whilst retaining a minimum of 1,200kg/ha of DMY at the end of the dry season. Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions.	Possible	High	Medium	Grazing management	Fences are in working order and allow for exclusion of cattle when needed. Signage will be installed on all major access gates to ensure the Environmental Offset Area is well signposted. Stocking rates are not fixed as this region is subject to significant changes in grass cover with seasonal conditions. However, grazing used as required when DMY exceeds 1,200kg/ha and the fire risk is high. Cattle are excluded from all areas during the wet season. Cattle are excluded from the riparian offset areas. Cattle are excluded from all areas during drought and when DMYs are below 1,200kg/ha	Unlikely	Minor	Low
Degradation of habitat or vegetation loss through thickening of native vegetation									
Thickening of vegetation in the offset area	Clearing or the harvesting of the larger trees for sawlogs and other timber products has resulted in a large number of eucalypt seedlings establishing resulting in a thickened or high stem density. The soil has a finite resource of nutrients and water, and this high density of stems results in a situation whereby the stems cease growing and stay at an immature condition/size unless a force majeure event or intervention occurs to reduce the stem density and therefore allowing larger trees to establish and therefore hollows to be produced.	Possible	High	Medium	Offset area management	Ecological burns to be undertaken in the offset area only in REs 11.5.2 to reduce the stem density of the eucalypt vegetation when there is a density of >750 immature trees/ha[4]. This is done only to reduce competition for soil resources and therefore promote larger trees becoming established.	Unlikely	Minor	Low
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5-, 10-, 15- and 20-year timeframes, respectively									
Offset fails to achieve the interim performance targets and/or completion criteria within the anticipated 5, 10-, 15- and 20-year timeframes, respectively	Failure to achieve and maintain offset completion criteria	Possible	High	Medium	Offset area management	Implement the management actions of this BOMP. Monitor and report on attainment of interim environmental performance targets and completion criteria.	Unlikely	High	Medium

[4] Glossary, Accepted development vegetation clearing code, Managing regulated regrowth vegetation, Effective date 7th February 2020; compiled by the Department of Natural Resources, Mines and Energy

8 Offset management measures

The terrestrial offset area management measures have been prepared in accordance with the specific requirements for the BOMP in the EPBC Act approval conditions (*Table 2*).

The offset area management measures include, but are not limited to, management actions required on the offset site to abate those threats identified to the koala and the squatter pigeon (southern). The offset area management measures provide for the management, reporting, and the monitoring program (*Table 15*) that will be undertaken for the period of EPBC Act approval. Protection of the offset area will be maintained under the VM Act as a Category A area of vegetation (vegetation subject to a restoration order or an offset).

The management actions include:

- Limiting vegetation clearing to only those areas required for maintaining fencing and fire control lines
- Prohibiting alternate land use and activities during the period of the declared area (e.g. timber harvesting, cropping)
- Restricting unauthorised access
- Excluding domestic livestock from the offset area except for the infrequent grazing associated with fuel reduction in dry periods
- Controlling feral animals
- Managing fire
- Controlling weeds

The management schedule describes the actions to be undertaken on the offset site (*Table 12*).

The offset property is located in koala district C under the Queensland Government Koala Conservation Plan. The management actions provide a higher level of protection to the species than that provided by the regulations that relate to koala district C.

Regular offset area reports will be prepared by the proponent as listed in *Table 15* and *Table 16* (Refer to *Section 11*). These will report against each of the management actions shown in *Table 12.* These management actions enable the offset site to improve to achieve the scores in *Appendix A*, thus attaining and maintaining the completion criteria required of the offset. The reports will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any force majeure events impacting the offset site, and any non-compliance with the management plan.

Table 12: Terrestrial offsets - management actions, triggers and corrective actions

The management actions shown in this table are consistent with the risks identified in the listing advice, conservation advices, and threat abatement plans in *Table 5.*

Threat to offset values	Management objective	Performance criteria	Management actions	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective action and timing
Degradation of habitat	Achieve the completion criteria and habitat quality improvements for offset values, which include the habitat quality scores in this BOMP	Increase the habitat quality scores for each offset value at each habitat quality assessment site based on the results of baseline and subsequent monitoring events to achieve the scores in the completion criteria	Implementation of the management actions and adaptive management framework as outlined in this BOMP.	Monitoring of offset value habitat quality scores will be undertaken in accordance with *Section 11*. The results of monitoring events will be compared against the habitat quality scores in the interim performance targets and completion criteria to determine the progress of the offset area and recorded as part of reporting (see *Section 11*).	Habitat quality scores for interim performance targets are not achieved for one or more offset values by: • Year 5 • Year 10 • Year 15 • Year 20	Step 1: Investigate cause of trigger: • Within one month after detection of the trigger, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved within the specified timeframes. • Within two months after detection of the trigger, complete a re-evaluation of the suitability of the relevant management measures in the BOMP. The re-evaluation must identify appropriate corrective actions. Step 2: Implementation of corrective action/s The appropriate corrective actions identified under Step 1 will be implemented as soon as practicable, and in any case within eight months after detection of the trigger. They may include (though are not limited to): • Third party review of the BOMP to provide input on the effectiveness of the management actions. • Increasing the frequency and intensity of pest animal and weed control measures or revising the type of measures to be implemented. • For offset values that have not achieved interim performance targets by year 20, for those offset values, the approval holder will obtain advice from senior ecologists and land managers with the aim of identifying appropriate additional management interventions
Habitat or vegetation loss through land clearing	Maintain the extent of offset value habitat within the offset area	No unapproved and/or intentional clearing of vegetation within the offset area, except for clearing that is required for fencing, access, firebreaks and public safety.	Protection of the offset area via a declared area under Section 19E and 19F of the VM Act, as described in *Section 12*, to be registered within six months of the approval of this BOMP.	Reporting to the Australian Government consistent with any and all EPBC Act approval(s).	Any activities in contravention of the declared area management plan.	Step 1: Investigate cause of trigger (e.g. unauthorised access) • As soon as practicable, and in any case within one month of detection of the trigger, identify appropriate corrective actions. Step 2: Implementation of corrective action/s • As soon as practicable, and in any case within two months of detection of the trigger, the appropriate corrective actions must be implemented. These may include (though are not limited to) additional fencing and/or signage and security for the offset area.
			Comply with the restrictions on clearing established throughout this BOMP. Construction and maintenance of access tracks, fencing and firebreaks will be undertaken in accordance with the requirements of *Table 12*. If vegetation clearing is required for fencing, access, firebreaks or public	Quarterly inspections will monitor and document if there is evidence of recent forestry or timber harvesting activities. Monthly and quarterly inspections will monitor and document vegetation clearing that has occurred for fire break, access road or fence line maintenance.	Detection of prohibited forestry operations, native timber harvesting or clearing outside of established access tracks, fire control lines and fence lines (existing infrastructure).	• Step 1: Upon being notified or becoming aware of prohibited forestry operations, native timber harvesting or clearing outside of existing infrastructure, the approval holder is to assess how unauthorised persons accessed the site, review existing access restrictions, and inspect signage and offset area fencing within one fortnight of detection of the clearing. • Step 2: All actions required to prevent recurrence of the prohibited clearing will be completed within one month of detection of the clearing.

Threat to offset values	Management objective	Performance criteria	Management actions	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective action and timing
			safety it must be undertaken in accordance with best practice management methods and any applicable legislative requirements.			
Degradation of habitat by overgrazing	Ensure that any livestock grazing for fire management and weed control maintains and enhances the ground cover attributes for MNES and does not result in the degradation of habitat and vegetation	Increase the richness and average % cover of native perennial grasses at each habitat quality assessment site based on the results of baseline and subsequent monitoring events	Stock will be grazed only when required to reduce DMY (i.e.: when DMY exceeds 1,800 kg/ha), and only during the dry season. DMY will not be reduced to less than 500 kg/ha. The dry season is normally between April and December; however, if unseasonal rainfall should occur, then grazing is to be allowed. Cattle grazing will be used from May to the end of October for fuel reduction purposes if required. As stated in the Squatter Pigeon (southern) SPRAT profile, optimal conditions for breeding success are likely to be regulated by the abundance of food resources. When considering the location of the Project, Central Queensland, grass seed are most abundant in summer and autumn after rain, with no grass seeds during the winter (dry season), circa May to November.	Habitat quality assessments will be undertaken in accordance with *Section 11*. These will include assessment of percentage cover of native perennial grasses Dry matter yield measurements must be in accordance with the Brigalow Belt pasture photo standards.[5]	Detection of stock grazing outside of the dry season, or during the exclusion period. Decrease in the richness and average ground layer cover at one or more habitat quality assessment sites based on the results of baseline and subsequent monitoring events.	Upon being notified or becoming aware of prohibited stock grazing in the offset area, the Pastoral Manager is to remove the stock from the area (if present) and assess the adequacy of fencing within 10 days. The Pastoral Manager is to undertake fence maintenance and repairs to resecure the offset area within 10 days.
Introduction, establishment and spread of non-native weeds including restricted invasive plants listed under the Biosecurity Act 2014 *(Qld)*	Manage restricted invasive plant species to reduce degradation of MNES habitat	Weed cover must not exceed 10% cover of the offset area by Year 20. No new restricted invasive plants listed under the *Biosecurity Act 2014* (Qld) are identified at any monitoring site (based on subsequent monitoring events).	The primary weed control method for exotic grasses will be grazing by cattle and then maintaining DMY and overall ground cover, which will be undertaken during the dry season (that is, from April to end of October each year). Parkinsonia will require foliar spraying or cut stump methods initially. Weed control will be undertaken as early as practicable within the natural regeneration process throughout the offset areas and then periodically as required to treat the weeds at the optimum time in their life cycles to	Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually. Weed cover is to be monitored and at the same time as the DMY measurements. Quarterly inspections will observe and record the presence of weeds and success of previously applied weed control measures. The inspection will include before and after photos of the weed control area.	Pest plants dominate isolated area and or occur in an area greater than 10% of the offset area. A new declared pest weed species is identified at one or more monitoring sites, or opportunistically during any site inspection or other monitoring.	Step 1: Investigate cause of trigger Step 2: Implementation of corrective action(s) Upon being notified or becoming aware of pest plants dominating isolated areas and or occupying greater than 10% of the offset area, the Pastoral Manager is to implement pest control measures within one month. These measures may include, and are not limited to: • foliar spraying • basal bark spraying • stem injection • cut stump • cut and swab • stem scraper • wick applicators.

[5] Available at https://futurebeef.com.au/resources/brigalow-belt-pasture-photo-standards/

Threat to offset values	Management objective	Performance criteria	Management actions	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective action and timing
			control and minimise the spread of the existing weed species.	Quarterly inspections will be conducted by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder to record the DMY in the offset area.		
Increased population of feral animals in the offset area. *Wild cat, pig and dog populations are prevalent and highly transient, and therefore the scale of impact is potentially large. Major damage to the environment/habitat occurs when large numbers of animals congregate in the area.*	Minimise the introduction of pest animals and control of existing populations of pest animals (wild dogs, pigs, feral cats and foxes) within the offset areas in accordance with the *Biosecurity Act 2014* (Qld).	Detection of twelve or more wild pigs or dogs during any inspection.	Implement control actions for pest animals in accordance with *Table 12*. Participate fully in, and cooperate with, any and all regional pest control programs, unless those would otherwise contravene a part of this BOMP.	Undertake monitoring for pest animals in accordance with *Section 11*.	Any observed or suspected apparent substantial decline in squatter pigeon abundance detected during periodic full BioCondition assessments, or during quarterly site inspections (including site meander survey). Any observed evidence of feral animal presence (that is, an indicator of feral animals required to be recorded as part of the feral animal monitoring requirements by the landholder detailed in *Table 12*.)	• Upon being notified or becoming aware of pest animal populations exceeding the threshold, the Pastoral Manager is to implement all necessary or appropriate control measures needed to reduce pest animal populations to below trigger thresholds. The land manager is to have completed implementation of all necessary or appropriate pest control measures within one month. • The Pastoral Manager or Landholder may approach neighbouring landowners to discuss the increased pest animal presence and an integrated control program may be developed. If an integrated control program is considered appropriate, the land manager will make best endeavours to reach agreement with neighbouring landowners to implement such a program. • If impacts from the pest animal populations have not naturally remediated within six months of completion of implementation of the control measures, the land manager is to undertake and complete all works required to remediate those impacts.
Degradation of habitat by feral pigs	Minimise degradation of MNES habitat by feral pigs.	Reduction in mean feral pig abundance from the first year of management.	Implement control actions for feral pigs in accordance with *Section 8*. Participate fully in, and cooperate with, any and all regional pest control programs, unless those would otherwise contravene a part of this BOMP.	Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder at least four times annually. Quarterly inspections will involve traversing the offset area with streams, low lying areas and vehicle access tracks being noted to record the presence of wallow holes, tracks and visual incidents in the offset area. If detected, these areas will be GPS-recorded and photographed and rechecked at the next quarterly inspection.	An increase in mean feral pig abundance from first year and subsequent monitoring events.	
Fire *The impact from uncontrolled*	No evidence of unplanned and uncontrolled fire	Uncontrolled fire does not occur in the offset area. Planned and controlled ecological burns are restricted to <25%	Implement fire management in accordance with requirements in this BOMP.	Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person appointed by the	Destruction of, or significant damage to, regrowth or fallen timber.	Step 1: Investigate cause of trigger • Within one month of detection of the trigger, complete an investigation into the reasons why the fire management measures have resulted in a decrease in habitat quality

Threat to offset values	Management objective	Performance criteria	Management actions	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective action and timing
fire would be a reduction in groundcover, thinning of the canopy and slowing of the offset site achieving the completion criteria. *Due to the scale of the mapping products, site specific data is not available. Anecdotal evidence from the landholder indicates that unplanned fire results from fire encroaching from the National Park.*	in the offset area	of the offset area in any 12-month period.	If one or more bushfires are current in the region and considered potentially threatening to the site, coordinate with all relevant fire authorities to determine the appropriate method of protecting the site (if the relevant fire authorities advise against seeking to protect the site from a specific fire, the approval holder may comply with that advice without needing approval or agreement from DCCEEW). The approval holder will maintain firebreaks along all external boundaries of the offset area. Fire control lines must be inspected quarterly. Maintenance must be undertaken as required and at least once every two years. Please note: if fire damages the offset areas, that constitutes an incident for the purposes of *Section 11*. In the offset area, a cold fire is only to be used at 3 to 5-year intervals during the months of June, July, August and September, when wind speeds are less than 5km/h on the offset site.	approval holder at least four times annually. Quarterly inspections will monitor and document if there is evidence of wildfire, prohibited burning or force majeure events. Quarterly inspections will monitor and document if a prescribed low-intensity ecological burn has occurred, and recorded in the Annual report with the written advice from an ecologist or other suitably qualified person (e.g. Fire Warden) Weed cover is to be monitored by the same methodology and at the same time as the DMY and weed control undertaken after a fire event to ensure weed cover (weeds of national significance) is <10%. Dry matter yield measurements must be in accordance with the Brigalow Belt pasture photo standards. The approval holder and the land manager will keep themselves informed of any bushfires in the region.	The occurrence of deliberately lit fires.	scores. That investigation must review adherence to the fire management measures and must identify appropriate corrective actions. Step 2: Implementation of corrective action/s • Corrective action: upon being notified or becoming aware of a prohibited fire in the offset area, the landholder is to reassess and implement new access protocols for any lessees etc., signage and general access within one fortnight. • Corrective action: subsequent to any occurrence of fire in the offset area, the Pastoral Manager, Landholder or suitable qualified person appointed by the Landholder will: 1. inspect and repair, and widen if necessary, all firebreaks; and 2. reassess fuel load reduction practices; and 3. exclude grazing until the DMY is above 1,200 kg/ha
Offset fails to achieve the interim performance targets and completion criteria within the anticipated 5, 10, 15 and/or 20-year timeframes, respectively	Achieve the interim performance targets and completion scores in *Section 9* at years 5, 10, 15 and 20 years, respectively.	The interim performance targets are achieved by year 5, 10 and 15. The completion criteria are achieved by year 20.	All management actions outlined in in this BOMP will be implemented to ensure that the interim performance targets and completion criteria are achieved.	Monitoring of the offset area will be undertaken in accordance with *Section 11*. The results of monitoring events will be compared against the interim performance targets and completion criteria to determine the progress of the offset area and recorded as part of reporting.	Interim performance targets are not achieved by year 5, 10 or 15. Completion criteria are not achieved by year 20.	Step 1: Investigate cause of trigger • Within one month of detection of the trigger, complete an investigation into the reasons why the interim performance targets or the completion criteria were not achieved within the specified timeframes. This investigation must re-evaluate the suitability of the relevant management measures in the BOMP and must identify appropriate corrective actions. Step 2: Implementation of corrective action/s As soon as practicable, and in any case within eight months of detection of the trigger, complete implementation of the corrective actions identified under Step 1. These may include (though are not limited to): • Increasing the frequency and intensity of pest animal and weed control measures or revising the type of measures to be implemented. • Modifying the fire management measures, to better support enhancement of offset values. If the investigation under Step 1 recommends changes to the management regime, then as soon as possible, and in any

Threat to offset values	Management objective	Performance criteria	Management actions	Monitoring	Trigger for adaptive management and corrective action(s)	Corrective action and timing
						case within six months of detection of the trigger, implement a revised BOMP incorporating those recommended changes.
Site access	Unauthorised persons, vehicles, and/or stock are prevented from accessing the site, and authorised stock are prevented from incurring during exclusion times	Public access to the offset area is prohibited. Access is restricted to those authorised persons required to undertake actions described in this management plan, including the landholder, and approval holder staff and their contractors and assigns. The offset area is not to be utilised for any purpose including recreational activities, or any other activities that deter from achieving the outcomes of this plan. No evidence of unauthorised persons, vehicles, and/or stock is detected on site at any point. Fences and signage are erected at all necessary points and kept in good repair throughout the life of the EPBC Act approval.	Fences will be maintained around to prevent unauthorised access and to control stock presence. Signs will be erected at all entrances and potential access points to the site stating that access to the site is forbidden. All signs and any new planned fences will be erected within six months of the approval of this BOMP.	Monitoring of this management action will be undertaken by the Pastoral Manager, Landholder or suitable qualified person within 3 months of the offset area being legally secured and during quarterly inspections. Quarterly inspections will monitor and document evidence of unauthorised access to the offset area. Quarterly inspections will monitor and document if signage is fit for purpose.	Evidence of unauthorised persons, vehicles, and/or stock is detected at any point. Evidence of stock is detected at any point during exclusion times. Damage is detected to any fence or sign.	For evidence of unauthorised persons, vehicles, and/or stock; or evidence of stock in an exclusion area: Step 1: determine access method • Upon being notified or becoming aware of prohibited access to the offset area, the Landholder is to reassess access protocols for any lessees etc., signage and general access within one fortnight. • Damage to signage will be repaired within one fortnight of noting the damage. • If there are areas that have been negatively impacted, the regeneration of those areas will be added to the monitoring sites at *Table 17* and monitored during the quarterly inspections. • Signage will be repaired and maintained as required by the Pastoral Manager, Landholder or suitable qualified person appointed by the approval holder.

8.1 Responsible parties

As approval holder, BCC is accountable for implementing the plan. Completing the actions will be ensured through the annual reporting requirements (*Section 11*). BCC will coordinate reporting, reviewing, inspections, auditing and any adaptive management changes to the plan. A person within BCC (e.g. Environment Manager) will be assigned the responsibility of managing offset requirements for the company.

In keeping with approval condition 13, BCC will maintain accurate records substantiating all activities related to the management of the offset area, and the monitoring of the offset site, as described in *Section 11*. These records will be made available to the Department on request.

BCC will undertake the offset management actions and day to day management of the site, including fencing, managing fire breaks, weed management, feral animal management and grazing management. BCC will also undertake the landholder reporting as per *Table 16*.

BCC will engage senior or principal ecologists to undertake the BioCondition assessments, ecological studies and surveys, prepare reports and undertake inspections, as required.

8.2 Emergency procedures

Incidents identified at any of the offset sites will be reported by the lessee to BCC. The level of severity will dictate the necessary actions through the company's formal incident management system. General incidents, for example, wild dog incursion, will be managed by BCC and responses to incidents adversely impacting habitat quality on the offset site, or MNES directly, will be coordinated by BCC, to ensure remediation or enhanced management measures (*Table 12*) are implemented to address the incident as soon as reasonably possible.

In keeping with approval condition 12, BCC will notify DCCEEW within 2 business days of becoming aware of any incident, non-compliance with conditions, or non-compliance with any of the commitments made in this BOMP. (See also *Section 13* Adaptive management and plan review).

9 Offset completion criteria and performance targets

Offset completion criteria have been determined for each species based on an understanding of the specific habitat, connectivity and other ecological values for the koala and squatter pigeon (southern). These criteria were initially derived from detailed ecology survey information of both the impact and offset sites. The impact site survey was conducted in compliance with the *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Version 3.2) (Neldner et al. 2012). Survey work at the offset site utilised the approach specified within the *Guide to determining terrestrial habitat quality* (DEHP, 2017). The targeted habitat quality meets guidelines published by ANZMEC (2000),[6] stating completion criteria should be:

1. Specific enough to reflect the unique set of environmental, social and economic circumstances.
2. Flexible enough to adapt to changing circumstances without compromising objectives.

[6] *Strategic Framework for Mine Closure.* (2000). Australian and New Zealand Minerals and Energy Council and Minerals Council of Australia. Canberra, ACT.

3. Include environmental indicators suitable for demonstrating that rehabilitation trends are heading in the right direction.
4. Undergo periodic review resulting in modification if required due to changed circumstances or improved knowledge.
5. Based on targeted research which results in more informed decisions.

Over the course of the management period a set number of interim completion criteria have been proposed for each species to track the trajectory of habitat quality improvement towards the desired final completion criteria. The timing for these interim targets corresponds with the 5 yearly targeted species surveys and detailed ecological condition monitoring in years 5, 10, 15 and 20.

Interim targets were derived for each species by identifying the attributes expected to increase over the period of the approval. The values were determined by differentiating between specific attributes, of which the majority were longer term targets (e.g. species richness, tree canopy cover, number of large trees) and those where an initial benefit could be realised early (e.g. recruitment of woody species, reduction of non-native plant cover, reduction in risks to the species such as increased feral animal control, removal of the ability to clear regrowth vegetation).

The completion of management actions identified in Table 12 will enable the offset site to improve and achieve the scores required in Appendix A, thus meeting and maintaining the completion criteria required of the offset. The annual reports (see Section 11) will provide transparency regarding how the site management actions are being implemented, and where relevant, identify any force majeure events impacting the offset site, and any non-compliance with the management plan.

The increase in scores in the regrowth areas are achievable. Regrowth, once the risk of clearing and appropriate fire, grazing (if required for fuel reduction purposes) and weed management are implemented, increases in height and canopy cover, shrub layer development rapidly over a 10- to 15-year period (beneficially to both koala and squatter pigeon). Additionally, some of the scoring increase is due to the reduction in risks (clearing and pest and animal control), the increase in connectivity of the patch and the context of the patch in the landscape. A reduction in non-native ground cover is also beneficial for the squatter pigeon. The scores are achievable and have a low risk of not being met, as detailed in *Table 11*. If interim monitoring undertaken by ecological surveys indicates that improvements are not occurring, then corrective actions as per *Table 12* will be implemented.

As per approval condition 7.b), the entire koala offset area has been identified as suitable squatter pigeon habitat.

Table 13: Interim targets and completion criteria for the koala offset

Protected matter	EPBC status	Impact area (ha)	Habitat quality score	Regional ecosystems	Assessment Sites	Offset area (ha)	Habitat start quality score	Habitat quality score Year 5	Habitat quality score Year 10	Habitat quality score Year 15	Habitat finish quality score
Koala	Vulnerable	248.94	6	11.5.2 11.5.2 (regrowth) 11.5.2a	THQ 1 (11.5.2) THQ 3 (11.5.2) THQ 5 (11.5.2) THQ 6 (11.5.2) THQ 8 (11.5.2) THQ 11 (11.5.2) THQ 17 (11.5.2) THQ 20 (11.5.2) THQ 12 (11.5.2 HVR) THQ 13 (11.5.2 HVR) THQ 14 (11.5.2a) THQ 16 (11.5.2a)	586.3 207.60 81.50	5 4 5	5 - 5.5 4 - 4.5 5 - 5.5	5.5 - 6 5 - 5.5 5.5 - 6	6 - 6.5 5.5 - 6 6 - 6.5	7

** The Koala EPBC Act listing was upgraded to endangered in February 2022; however, the Project BOMP is subject to the threatened species listing at the time of the controlled action decision on 31 July 2014.*

10 Offset site management and protection additional to those that currently exist

Securing the offset area will add additional protection for biodiversity values from clearing[7] and provide additional management of weeds and pest animals that are additional to the general requirements for biosecurity.

The offset area is not protected from timber harvesting, the inappropriate use of hot fires or the under-sowing of exotic pasture species by either the VM Act or the EPBC Act due to exemptions within the legislative frameworks for the continuing use of the land. Remnant vegetation areas are protected from broadscale clearing under the VM Act; however, the clearing of regrowth is permitted (see the offsets maps at *Figure 6* and *Figure 7*). Maintaining the existing condition of regulated vegetation and land for habitat values is not addressed under the VM Act.

The *Biosecurity Act 2014* (Qld) (the **Biosecurity Act**) imposes a 'general biosecurity obligation' on all Queenslanders to manage biosecurity risks that are under their control and that they know about or could reasonably be expected to know about.[8] In practical terms, this means that:

- If you are a livestock owner, you are expected to stay informed about pests and diseases that could affect or be carried by your animals, as well as weeds and pest animals that could be on your property. You are also expected to manage them appropriately.
- If you are a landowner, you are expected to stay informed about the weeds and pest animals (such as wild dogs) that could be on your property. You are also expected to manage them appropriately.

The Biosecurity Act assigns the pests identified in the offset areas as Restricted Matters in Categories 1-7 and requires the following management as shown below in *Table 14*.

Table 14:* Biosecurity Act 2014 *(Qld) obligations

Category	What is required	Examples
1	Must advise an authorised officer within 24 hours of becoming aware	Electric ant/ Little Fire ant, Red imported fire ant
2	Must advise an authorised officer within 24 hours of becoming aware	Noxious fish, including alligator gar and black pacu
3	Must not distribute, be traded or released into the environment	Most invasive weeds, pest animals, noxious fish
4	Must not move	Certain weeds, pest animals, noxious fish such as feral pigs, feral deer, rabbits, Hudson pear and jumping cholla cactus
5	Must not possess or keep	Rabbits, carp, bunny ears cactus
6	Must not feed (except if undertaking a control program)	Feral deer, wild dogs, rabbits, foxes, noxious fish
7	Must, as soon as practicable, kill the restricted matter	Noxious fish, including tilapia, gambusia, carp

[7] *Vegetation Management Act 1999* (Schedule definitions)

[8] See https://www.daf.qld.gov.au/business-priorities/biosecurity/policy-legislation-regulation/biosecurity-act-2014/general-biosecurity-obligation

The obligations in the BOMP are additional to these general obligations, in that control is required once thresholds as detailed in *Table 12* are met, which initiates the respective controlling actions. For example, there is a requirement to control wild pigs if numbers in excess of 12 are observed in any one property inspection; this is above and beyond the requirements of the Biosecurity Act, as is the reduction of weed species to 10% of the offset area over the life of the management plan.

The Colorado property is located within the CHRC local government area. The CHRC *Biosecurity Plan 2017-20* states only that landholders are required to "meet their general biosecurity obligations with respect to biosecurity matter on their land." [9]

11 Monitoring and reporting

The monitoring methods (*Table 15*) will enable comparative changes in vegetation condition against baseline data collected on the offset site, as well as attainment and maintenance of the offset completion criteria (see *Section 9* and *Appendix A*). Furthermore, the monitoring will measure changes resulting from the management actions and variability due to climatic conditions. This will inform the nature and frequency of management actions required and if trigger levels are breached, the use of corrective actions to bring the offset back into compliance.

Note that the methodologies listed, and the RE benchmarks used in the establishment of the baseline data, will be used consistently throughout the reporting period to enable the comparison of data.

BCC, its successors or assigns, will, as per Condition 14 of the Approval, provide an Annual Compliance Report each year following the date of the commencement of the action for the period of the approval. Offset Area Reports describing the progress of the offset area over the relevant 12-month period will be part of those reports until the completion criteria are achieved or the end of the EPBC approval (i.e. until 1 July 2034), whichever comes first. The monitoring methodology and schedule is outlined in *Table 15*. The reporting schedule is provided in *Table 16*. The location of the monitoring sites is shown at *Figure 8* and *Figure 9.* The coordinates of the monitoring sites are shown in *Table 17.*

The Offset Area Reports will contain records substantiating all activities relevant to the implementation and management of the offsets, in keeping with the requirements of condition 14 of the approval.

BCC, its successors or assigns, will publish the annual compliance reports, of which the Offset Area Reports form a part, on the website within three months of the relevant 12-month period. BCC, its successors or assigns, will supply documentary evidence showing proof of the date of publication of the compliance report will be supplied to the Department at the same time that the compliance report is published. These commitments ensure that Condition 14 of the approval is being met.

Commonwealth threatened species survey guidelines used to inform the requirements of the terrestrial flora and fauna surveys will include:

- Survey guidelines for Australia's threatened birds (DEWHA 2010)
- Survey guidelines for Australia's threatened mammals (SEWPaC 2011)
- Species profile and threats database for relevant EPBC Act listed species and communities

[9] CHRC *Biosecurity Plan 2017-20*, p.12. Available at: https://www.chrc.qld.gov.au/wp-content/uploads/2016/09/ECM_1150510_v2_Central-Highlands-Regional-Council-Biosecurity-Pla.pdf

Table 15: Monitoring schedule and methodology to be used

Monitoring	Attributes monitored	Timing	Method	Location/s
Surveys undertaken by senior or principal ecologists every 5 years				
Targeted habitat quality assessments of habitat	Nature and quality of habitat attributes for koala and squatter pigeon (southern). Presence of koala and squatter pigeon (southern) in the offset area, including estimated numbers and location of sightings.	Years 5, 10, 15 and 20 (March – May)	*Survey guidelines for Australia's threatened birds* (DEWHA 2010) *Guide to Determining Terrestrial Habitat Quality Version 1.2* (DEHP, 2017). Although this methodology has been updated to version 1.3, the methodology used in the original studies (v1.2) will be used throughout the life of the BOMP to avoid inconsistencies in scoring.	Across the offset area
Ecological condition and relevant habitat features using BioCondition assessments	Recruitment of woody perennial species in EDL	Years 5, 10, 15 and 20 (March – May)	Field observations, vegetation assessment as per the *BioCondition: A Condition Assessment Framework for Terrestrial Biodiversity in Queensland Assessment Manual* (Eyre et al., 2015b) Data for each of the ecological condition attributes monitored will be collected at each site listed in *Table 17* and reported on and presented in a sequential manner (including previous data collected) to quantify change from the baseline condition. This will record the change in each attribute measured and hence the condition of the habitat, thus enabling a statistical comparison to previous years' data and tracking towards attainment of the offset interim and final completion criteria. Scoring is to be consistent with the *Guide to Determining Terrestrial Habitat Quality Version 1.2* (Department of Environment and Science, 2017).	Sites listed in *Table 17*
	Native plant species richness – trees			
	Native plant species richness – shrubs			
	Native plant species richness - grasses			
	Native plant species richness – forbs			
	Tree canopy height			
	Tree canopy cover			
	Shrub canopy cover			
	Native perennial grass cover			
	Organic litter			
	Large trees			
	Coarse woody debris			
	Non-native plant cover			
	Quality and availability of food and foraging habitat			
	Quality and availability of shelter			
Note that the methodologies listed, and the RE benchmarks used in the establishment of the baseline data, must be used consistently throughout the reporting period to enable the comparison of data.				

Monitoring	Attributes monitored	Timing	Method	Location/s
Quarterly landholder/approval holder records and monitoring (report to approval holder – end of September, December, March and June each year)				
Forestry operations, native timber harvesting and general vegetation impacts	Any incidence of native plant destruction	Monitored quarterly and reported annually in Offset Area Report until the offset completion criteria are achieved.	Forestry Operations, Native Timber Harvesting and general vegetation impacts	Across the offset area
Unauthorised impacts to vegetation from activities such as illegal access/ camping	Vegetation, woody debris, grass cover, weed cover, feral animal damage and presence	Monitored quarterly and reported annually until the offset completion criteria are achieved.	BCC or person appointed by BCC will undertake quarterly inspections of the offset area to observe and record grass cover levels, weeds, accessibility (i.e. condition of fencing), and evidence of fire, erosion, and feral animal incursion. The inspection records will be provided to the approval holder and serve as the primary data source for the Offset Area Report. Grass cover assessment is to be undertaken as per the dry matter yield measurements in accordance with the Brigalow Belt pasture photo standards. This is in addition to biocondition assessments.	Across the offset area
Grazing	Cattle stocking rates Grass cover	Monitored monthly during grazing periods (dry season or as otherwise authorised) in accordance with *Table 12* and reported annually until the offset completion criteria are achieved.		
Unplanned fire	Occurrence, control measures implemented, timing and result of the control measures as per Table 15.	Monitored quarterly and reported annually until the offset completion criteria are achieved.		
Weeds	Occurrence, control measures implemented, timing and the result of the control measures as per Table 15.	Monitored quarterly and reported annually until the offset completion criteria are achieved	Weed cover is to be monitored by the same methodology and at the same time as the grass cover measurements. This is in addition to biocondition assessments.	Across the offset area
Pest animals	Occurrence, control measures implemented, timing, number and type of animal/s and the result of the control measures as per Table 15.	Monitored quarterly and reported annually until the offset completion criteria are achieved	Quarterly inspections will involve traversing the offset area along streams, low lying areas and vehicle access tracks, to record the presence of wallow holes, tracks and any visual incidents. If detected, these locations will be GPS'd and photographed and rechecked at the next quarterly inspection. Any evidence of predation on koalas must be reported immediately to the approval holder and corrective actions implemented (*Table 12*).	Across the offset area

BCC or a suitably qualified person appointed by the Landholder will undertake quarterly inspections of the offset area to observe and record DMY, pest plants, accessibility (i.e. condition of fencing), evidence of fire and evidence of pest animal incursion. The inspection records will serve as the primary data source for the annual Offset Area Report.

Dry matter yields are to be assessed as per the Brigalow Belt pasture photo standards.[10]

Table 16: Reporting schedule

Report Details to DCCEEW	Reporting period	Submission due date
Annual Offset Area Report, which contributes to the Annual Compliance Report as per Approval Condition 14, detailing photo point (including coordinates), implementation of management actions, any triggers for corrective actions and implementation of those corrective actions, if implemented, and offset condition outcomes. Note: the reports and results from the detailed 5-yearly ecology survey (BioCondition assessments) and monitoring events, conducted in accordance with *Table 15* will be provided as an Appendix to the subsequent Annual Offset Area Report.	Annual Offset Area Report - from the date of approval of this BOMP to 30 May 2024 for the first report	30 June 2024 for the first report
	1 May – 30 May annually until the offset completion criteria are achieved and then every 5 years until June 2034	30 June each year as required
Compliance Report detailing compliance with approval conditions under the EPBC Act, including compliance with the offset conditions, as detailed in this BOMP.	Every 12 months following commencement of the action, as per approval condition 14.	1 July every year for the duration of the approval

[10] https://futurebeef.com.au/knowledge-centre/brigalow-belt-pasture-photo-standards

Table 17: Monitoring sites

Regional ecosystem	**Survey site number** (to be consistent with the baseline data collected for the duration of the BOMP)	Ha in the offset area	Location - easting	Location - northing
RE 11.5.2	THQ 1	586.3 ha	718053.17	7385589.45
	THQ 3		716691.38	7385885.35
	THQ 5		715122.11	7385830.74
	THQ 6		714593.92	7384881.28
	THQ 8		712555.25	7384044.93
	THQ 11		714659.93	7386449.76
	THQ 14		715293.28	7388058.82
	THQ 17		714788.93	7389004.73
	THQ 20		713471.87	7386690.39
RE 11.5.2a	THQ 16	81.5 ha	715358.72	7389262.01
RE 11.5.2/11.5.2a HVR*	THQ 12	207.6 ha	714997.78	7386777.95
	THQ 13		714787.93	7387640.16

Coordinates system: GDA_2020_MGA_Zone_55

**Mapped as 90% RE 11.5.2 and 10% RE 11.5.2a, considered as RE 11.5.2 due to the small size of RE 11.5.2a. See* Section 5.2 *for further information.*

Figure 8: Offset area koala transect and SAT sites monitoring sites – Colorado

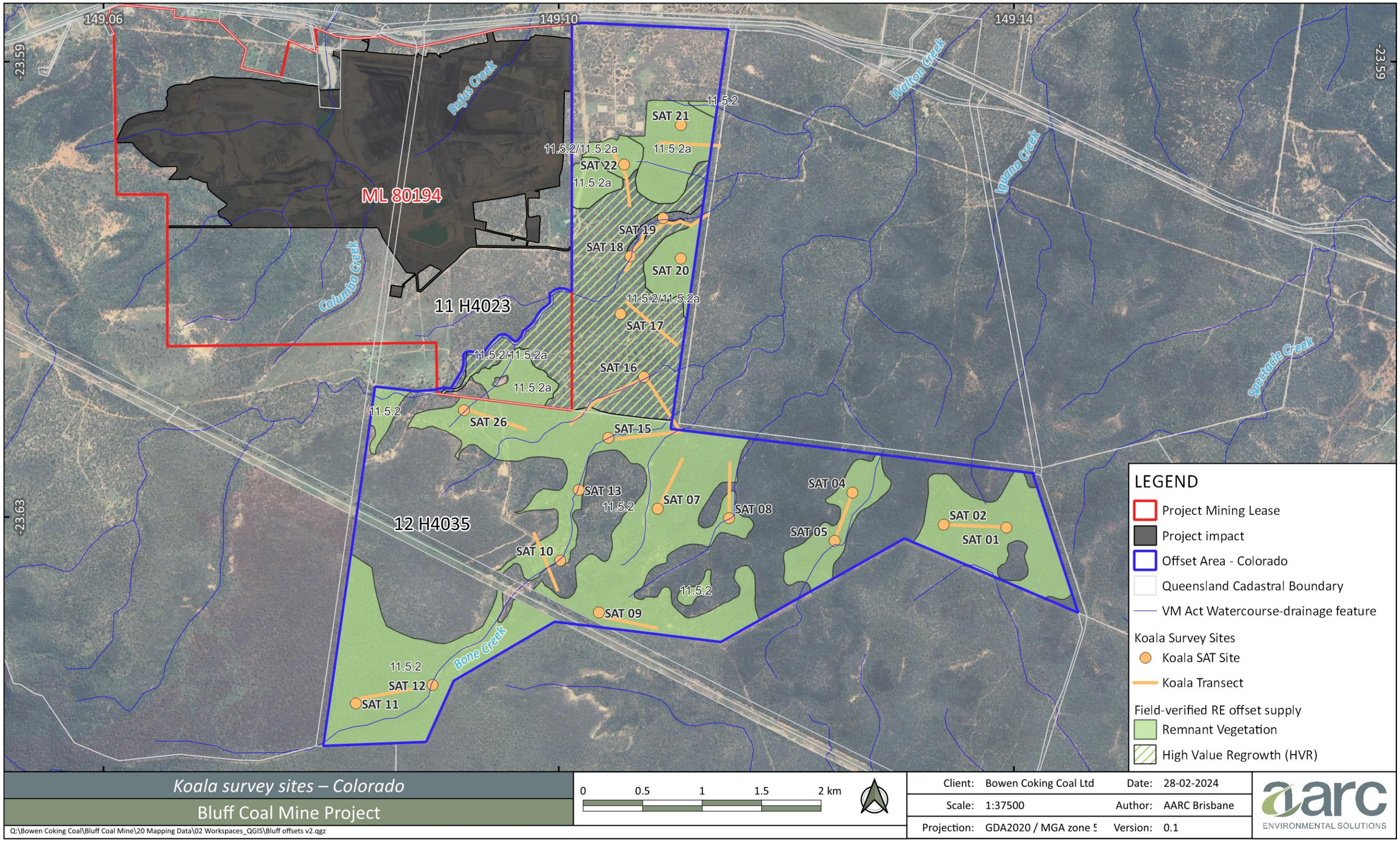
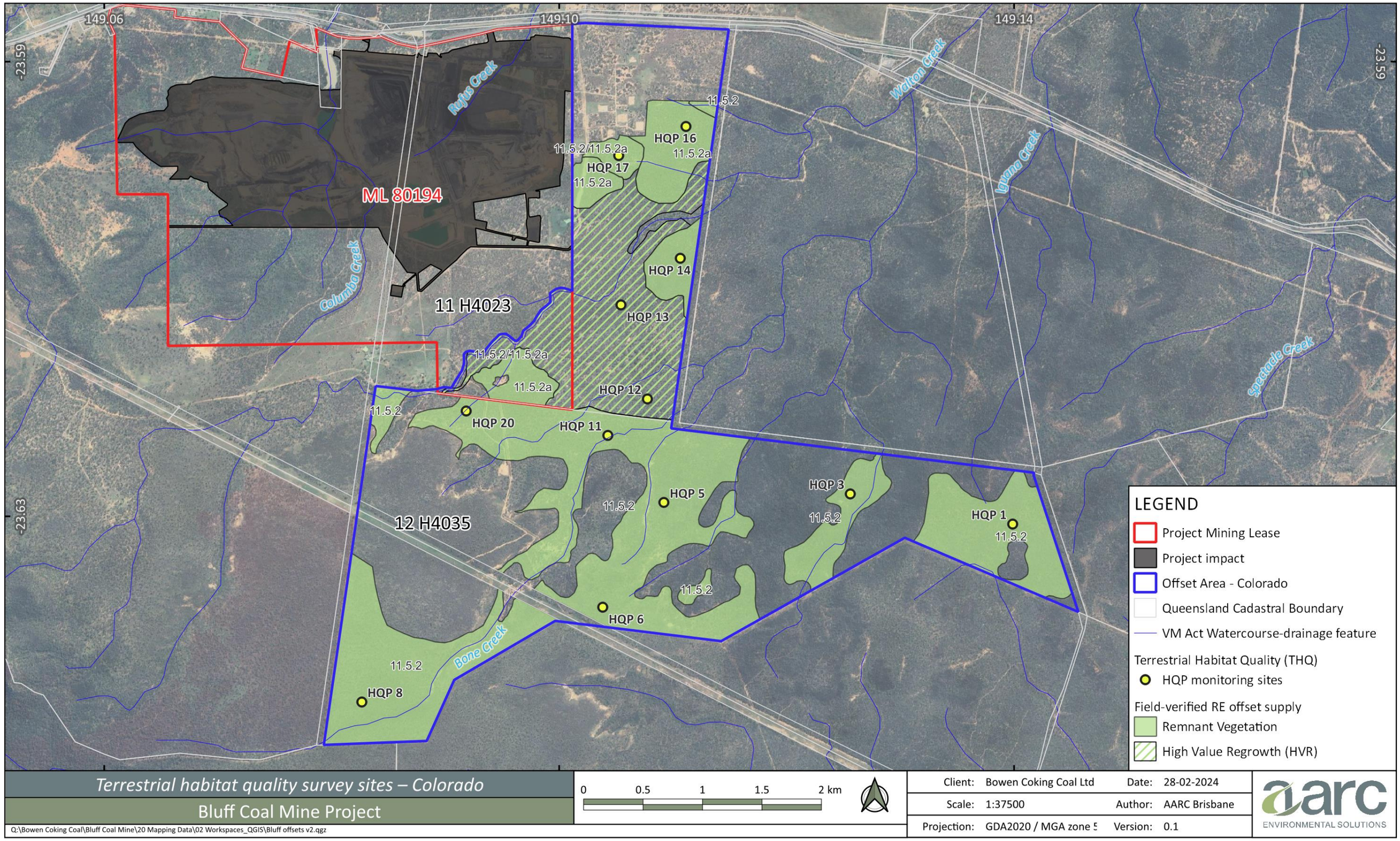


Figure 9: Offset area ecological equivalence methodology and biocondition monitoring sites



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12 Legally binding mechanism

The offset will be secured by being declared as an area of high conservation value under section 19F of the VM Act. Once this has been registered on the title, the offset area will be mapped as a category A area on the property map of assessable vegetation (**PMAV**). An area mapped as category A on a PMAV is described as an 'area subject to compliance notices, offsets and voluntary declarations'.

Title searches for the subject lots of the offset property are provided at *Schedule 1.1 and 1.2*. The request for a declared area form, and the declared area management plan form are provided at *Schedule 1.3* and *1.4*. Both of these forms are requirements of the Queensland Department of Resources so that the legally binding mechanism may be lodged on the title of the property.

The approval holder will legally secure the environmental offset within 18 months of the date that the BOMP is approved by the Minister. The approved BOMP must be attached to the legal mechanism used to legally secure the environmental offset. The approval holder will notify the Department within 5 business days of the mechanism to legally secure the environmental offset having been executed.

Management and monitoring of the offset area will be undertaken in accordance with commitments in the approved BOMP.

The declared area will remain in place as the legally securing mechanism for the offset area. The declared area and approved BOMP will ensure the offset completion criteria are attained, and then maintained for the period of the EPBC Act approval (i.e. until 2034). Statutory protection of the offset area is maintained under the VM Act, NC Act and EPBC Act (or subsequent legislation).

13 Adaptive management and plan review

This plan has been prepared to be implemented until the offset completion criteria have been achieved when the approval for the action ceases. Management measures will be reported in the Offset Area reports, and adapted, where required, if triggers are reached and corrective actions are implemented (see *Table 12*). If management measures need substantial adjustment, BCC will review this plan in consultation with the DCCEEW.

In accordance with EPBC approval condition 12, BCC will provide to the Department the details of any incident or non-compliance with the conditions or commitments made in this BOMP as soon as practical and no later than 2 business days after becoming aware of the incident or non-compliance, specifying:

a) the condition that the approval holder has potentially breached
b) the nature of the non-compliance
c) when and how the approval holder became aware of the non-compliance
d) how the non-compliance will affect the approved action
e) how the non-compliance will affect the anticipated impacts of the approved action, in particular how the non-compliance will affect the impacts on the MNES
f) the measures the approval holder will take to address the impacts of the non-compliance on the MNES and rectify the non-compliance
g) the time by when the approval holder will rectify the non-compliance.

In keeping with approval condition 16, If BCC wishes to carry out any activity otherwise than in accordance with this BOMP, BCC will submit to the Department for the Minister's written approval a

revised version of the BOMP. The varied activity will not commence until the Minister has approved the varied BOMP in writing. If the Minister approves the revised BOMP, that BOMP will be implemented in place of the BOMP originally approved.

If the Minister requests that BCC make specified revisions to the BOMP, BCC will develop and submit the revised BOMP for the Minister's written approval. BCC will implement the revised BOMP. Unless the Minister has approved the revised BOMP, then BCC will continue to implement BOMP originally approved. This commitment by BCC ensures compliance with approval condition 17.

14 Conclusion

This Biodiversity Offset Management Plan has been prepared to address all the requirements of the *Environment Protection and Biodiversity Conservation Act 1999*. This BOMP will be published on BCC's website within 1 month of the BOMP being approved by the Minister. The BOMP will remain on the website and accessible to the public for the duration of the EPBC Act approval, in keeping with approval condition 10.

The offset site on Colorado will successfully deliver offsets for the Bluff Coal Mine's residual significant impacts to koala habitat. The koala offset area provides the equivalent area in habitat for the squatter pigeon (southern).

This offset for the Project will be implemented consistent with the EPBC Act Environmental Offset Policy and the approval conditions for the project. The approval holder commits to the implementation of this plan.

The approval holder also commits to registering a legally binding conservation mechanism to provide long-term protection to the offset area as soon as practicable after the Minister's approval of the BOMP (subject to DoR processes to register the legally binding mechanism).

List of abbreviations

Abbreviation	Description
BCC	Bowen Coking Coal Limited
BOMP	Biodiversity Offset Management Plan
BVG	Broad vegetation group
CHRC	Central Highlands Regional Council
DAWE	Department of Agriculture, Water and the Environment (former)
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEHP	Department of Environment and Heritage Protection (Qld) (former)
DES	Department of Environment and Science (Qld)
DEWHA	Department of the Environment, Water, Heritage and the Arts (Australian) (former)
DMY	Dry matter yield
DoE	Department of Environment (Australian) (former)
DoEE	Department of the Environment and Energy (Australian) (former)
DoR	Department of Resources (Qld)
EOP	Environmental Offsets Policy (October 2012) (EPBC Act)
EPBC Act	*Environment Protection & Biodiversity Conservation Act 1999* (Cth)
EVNT	Endangered, vulnerable or near-threatened (species)
ha	hectares
HQS	Habitat quality scoring
HVR	High-value regrowth
km	kilometres
KoRV	Koala retrovirus
m	metres
ML	Mining lease
MNES	Matters of national environmental significance
NC Act	*Nature Conservation Act 1992* (Qld)
OAG	Offset Assessment Guide (DCCEEW)
OIA	Offset Investigation Area
PMAV	Property map of assessable vegetation
Project	Bluff Coal Mine
RE	Regional ecosystem
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities (Australian) (former)
SLC	Special least concern (species)
TEC	Threatened ecological community
THQ	Terrestrial habitat quality
VM Act	*Vegetation Management Act 1999* (Qld)
WoNS	Weed of national significance

Glossary

Term	Definition
Approval holder	The person to whom the approval is granted
Approved conservation advice/s	A conservation advice approved by the Minister under section 266B(2) of the EPBC Act.
Business day	A day that is not a Saturday, a Sunday or a public holiday in the state or territory of the action.
Category A vegetation	Under Queensland vegetation management legislation, Category A vegetation is an area which is: • a declared area • an offset area, an exchange area, an area that has been subject to unlawful clearing or an enforcement notice, an area subject to clearing as a result of a clearing offence • an area that the chief executive determines to be Category A. Category A areas are colour-coded red on the regulated vegetation management map. See *Vegetation Management Act 1999* (Qld), s20AL.
Category X vegetation	Under Queensland vegetation management legislation, all areas other than Category A, B, C and R areas are Category X areas. Some Category X areas are also identified on a PMAV as 'locked in'. Category X areas are also known as 'exempt areas' because activity in Category X areas is not regulated by the *Vegetation Management Act 1999*. Category X areas are colour-coded white on the regulated vegetation management map (see *Vegetation Management Act 1999* (Qld) s20A.).
Compliance report/s	Written reports: a) providing accurate and complete details of compliance, incidents, and non-compliance with the conditions and plans; b) consistent with the Department's Annual Compliance Report Guidelines (2014) (or subsequent published revision); c) include a shapefile of any impact of any protected matters, or their habitat, undertaken within the relevant 12 month period; and d) identifying the version/s of the plans prepared and in existence in relation to the conditions of this approval during the relevant 12 month period.
Control of grazing	Grazing specifically for the purposes of weed and fire management for one period per year (of no more than 2 weeks) prior to the annual fire season of the Bowen Basin and not occurring during the wet season of the Bowen Basin.
Critical koala habitat	Areas of vegetation found on the project site containing tree species known to be utilised for food or shelter and which are consistent with the following Queensland REs: • 11.3.25 *Eucalyptus tereticornis* or *Eucalyptus camaldulensis* woodland fringing drainage lines; • 11.5.3: *Eucalyptus populnea* +/- *Eucalyptus melanophloia* +/- *Corymbia clarksoniana* on Cainozoic sand plains and/or remnant surfaces;

Term	Definition
	• 11.5.2: *Eucalyptus crebra*, *Corymbia spp*., with *Eucalyptus moluccana* on lower slopes of Cainozoic sand plains and/or remnant surfaces; and • 11.5.2a: *Allocasuarina luehmannii* low tree layer with or without emergent woodland.
Department	The Australian Government Department administering the *Environment Protection and Biodiversity Conservation Act 1999*.
Habitat quality scores	A score out of ten, based on BioCondition assessment plus an assessment of habitat quality. A method of evaluating habitat quality within a particular community based on key indicators including site condition, site context and species habitat index (if necessary). The method produces a score out of 10, where the maximum score of 10 represents a fully intact system. Scores of 4, 5 and 6 may indicate good quality regrowth or medium value habitat.
Koala habitat	Areas of vegetation containing tree species known to be utilised for food or shelter.
Minister	The Minister administering the *Environment Protection and Biodiversity Conservation Act 1999*.
Offset Investigation Area	Area of land that was assessed for ecological values, within which an offset area could be selected, based on required values
Offset calculator	The *Offset Assessment Guide* spreadsheet tool as provided by DCCEEW
Plan/s	Any of the documents required to be submitted to the Department, implemented by the approval holder and/or published on its website in accordance with the approval conditions.
Property map of assessable vegetation	A map certified by the chief-executive as a PMAV for an area and showing the vegetation category areas for the area (e.g. Category C area, Category X area) See *Vegetation Management Act 1999* (Qld), section 20AK.
Regional ecosystem	Regional ecosystems are vegetation communities in a bioregion that are consistently associated with a particular combination of geology, landform and soil (Sattler and Williams 1999, *Vegetation Management Act 1999*).
Regrowth vegetation	Vegetation that is not remnant vegetation.
Regulated vegetation	Vegetation that: • is an endangered regional ecosystem, an of concern regional ecosystem, or a least concern regional ecosystem, and • forms the predominant canopy of the vegetation covering more than 50% of the undisturbed predominant capacity; averaging more than 70% of the vegetation's undisturbed height; and • composed of species characteristic of the vegetation's undisturbed predominant canopy.
Riparian zone	The area within a minimum of 100 metres of the defining bank of any watercourse (as defined under the Queensland *Water Act 2000*).
Sensitive ecological data	Data as defined in the Australian Government Department of the Environment (2016) *Sensitive Ecological Data – Access and Management Policy V1.0*.
Site habitat quality	A score on a scale of 0 to 10 representing a site's utility for each listed threatened species, where zero ('0') represents a site of no value to

Term	Definition
	the species, and '10' represents ideal habitat. Unless agreed otherwise by the Department, site quality must be comprised of 3 points for site condition, 3 points for site context, and 4 points for species stocking rate. These scores must be derived in accordance with the Queensland *Guide to determining terrestrial habitat quality: A toolkit for assessing land-based offsets under the Queensland Environmental Offsets Policy* (Version 1.2, April 2017), or subsequent published revision.
Site specific assessment/s	A baseline investigation which explains the scientific basis on which the description and location of impact/s and associated users, performance indicators, trigger values and limits have been derived, or not derived.
Squatter pigeon habitat	Includes: • Foraging Habitat - Gravelly, sandy or loamy soils, open-forest to woodland communities (dominated by *Eucalyptus*, *Corymbia*, *Acacia* or *Callitris* species), within 3 kilometres of a permanent or seasonal water body. • Breeding Habitat - Well-draining, gravelly, sandy or loamy soils, open-forest to woodland communities with patchy, tussock-grassy understories, within 1 kilometre of a permanent water body.
Suitably qualified ecologist	An individual with tertiary qualifications and/or a minimum of three years demonstrated experience relevant to the task in question and have expertise in the ecology of koalas.
Suitably qualified person	A person who has professional qualifications, training, skills and/or experience related to the nominated subject matter and can give authoritative independent assessment, advice and analysis on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature.
Target low shrub species	Is a ***low shrub*** species which comprises more than 50 per cent of the ***ground cover*** in the area covered by a notification made under the vegetation clearing code. See *Accepted development vegetation clearing code Managing regulated regrowth vegetation*; Department of Natural Resources and Mines. Effective 7 February 2020
Website	A set of related web pages located under a single domain name attributed to the approval holder and available to the public.

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Schedule 1: Legally binding mechanism

Schedule 1.1: Title search – Colorado L11 H4023

Titles QUEENSLAND

Current State Tenure Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**17647088**	**Search Date:**	25/08/2022 13:09
Date State Tenure Created:	21/10/1995	**Request No:**	42081273
Creating Dealing:			

DESCRIPTION OF LAND

Tenure Reference: GHPL 35/8789

Lease Type: PERPETUAL

LOT 11 CROWN PLAN H4023
Local Government: CENTRAL HIGHLANDS

Area: 868.885000 Ha. (SURVEYED)

No Land Description

No Forestry Entitlement Area

Purpose for which granted:
GRAZING OR AGRICULTURAL

REGISTERED LESSEE

Dealing No: 721517943 03/03/2022

BOWEN PCI PTY LTD A.C.N. 653 260 809

TERM OF LEASE

Day of beginning of lease

Lease in perpetuity commencing on 01/01/1977

CONDITIONS

M175 Subject to the condition of Occupation as defined by the Land Act.

M177 The lessee shall carry out and perform all the conditions to which the former selection was subject.

ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by Lease No. 17647088
2. MORTGAGE No 721823851 08/07/2022 at 14:45
GLOBAL LOAN AGENCY SERVICES AUSTRALIA NOMINEES PTY LIMITED
A.R.B.N. 608 945 008

ADMINISTRATIVE ADVICES

Dealing	Type	Lodgement Date	Status
712781276	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	08/10/2009 15:23	CURRENT
712824506	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	28/10/2009 09:52	CURRENT
717907906	CON COM AGMT MINERAL AND ENERGY RESOURCES (COMMON PROVISIONS) ACT 2014	20/03/2017 13:40	CURRENT
719767646	EXEMPT CONS SEC 322AA LAND ACT 1994	02/12/2019 08:28	CURRENT

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Titles QUEENSLAND

Current State Tenure Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	17647088

UNREGISTERED DEALINGS

NIL

Caution - Charges do not necessarily appear in order of priority

** End of Current State Tenure Search **

Information provided under section 34 Land Title Act (1994) or section 281 Land Act (1994)

Schedule 1.2: Title search – Colorado L12 H4035

Titles QUEENSLAND

Current State Tenure Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference:	**17647089**	**Search Date:**	25/08/2022 13:09
Date State Tenure Created:	21/10/1995	**Request No:**	42081273
Creating Dealing:			

DESCRIPTION OF LAND

Tenure Reference: GHPL 35/8790

Lease Type: PERPETUAL

LOT 12 CROWN PLAN H4035
Local Government: CENTRAL HIGHLANDS

Area: 1061.693000 Ha. (SURVEYED)

No Land Description

No Forestry Entitlement Area

Purpose for which granted:
GRAZING OR AGRICULTURAL

REGISTERED LESSEE

Dealing No: 721517943 03/03/2022

BOWEN PCI PTY LTD A.C.N. 653 260 809

TERM OF LEASE

Day of beginning of lease

Lease in perpetuity commencing on 01/01/1977

CONDITIONS

M175 Subject to the condition of Occupation as defined by the Land Act.

M177 The lessee shall carry out and perform all the conditions to which the former selection was subject.

ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
Lease No. 17647089

2. EASEMENT No 602802719 (A507) 06/04/1971
EASEMENT IN PURSUANCE OF AN AGREEMENT DATED THE 21ST DAY OF OCTOBER, 1970 BETWEEN THE LESSEE OF THE WITHIN-DESCRIBED HOLDING AND
THE CAPRICORNIA REGIONAL ELECTRICITY BOARD
FOR PURPOSES AS DEFINED IN SUCH AGREEMENT.

3. EASEMENT No 602802720 (A970) 28/07/1976
EASEMENT IN PURSUANCE OF AN AGREEMENT DATED THE 22ND DAY OF DECEMBER, 1975 BETWEEN THE LESSEE OF THE WITHIN-DESCRIBED HOLDING AND
THE CAPRICORNIA REGIONAL ELECTRICITY BOARD
FOR PURPOSES AS DEFINED IN SUCH AGREEMENT.

4. MORTGAGE No 721823851 08/07/2022 at 14:45
GLOBAL LOAN AGENCY SERVICES AUSTRALIA NOMINEES PTY LIMITED
A.R.B.N. 608 945 008

Requested by: D-ENQ TITLES QUEENSLAND

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Titles QUEENSLAND

Current State Tenure Search

Queensland Titles Registry Pty Ltd
ABN 23 648 568 101

Title Reference: 17647089

ADMINISTRATIVE ADVICES

Dealing	Type	Lodgement Date	Status
712781276	VEG NOTICE VEGETATION MANAGEMENT ACT 1999	08/10/2009 15:23	CURRENT
719767646	EXEMPT CONS SEC 322AA LAND ACT 1994	02/12/2019 08:28	CURRENT

UNREGISTERED DEALINGS

NIL

Caution - Charges do not necessarily appear in order of priority

** End of Current State Tenure Search **

Information provided under section 34 Land Title Act (1994) or section 281 Land Act (1994)

Requested by: D-ENQ TITLES QUEENSLAND

www.titlesqld.com.au

Schedule 1.3: Request for declared area – Colorado

Queensland Government

Department of Resources
ABN 59 020 847 551

Request for a declared area

ss19E-19L Vegetation Management Act 1999

Use this form to request an area of land to be declared an area of high nature conservation value or an area vulnerable to land degradation. For guidance on declared areas see the Guide to declared areas (hyperlink).

To apply for an area to be legally secured as an exchange area, complete the application to legally secure an exchange area. For guidance on legally securing an exchange area see the General guide to accepted development vegetation clearing codes.

1. Owner's (applicant's) details

Owner, of land includes -
(a) for freehold land - all registered owners; or
(b) for a lease, license or permit under the *Land Act 1994* – all lessees, licensees or permittees; or
(c) for indigenous land - the holder of title to the land; or
(d) for any tenure under any other Act - the holder of the tenure.

First name:		Middle name:		Surname:	
Company name:	Bowen PCI Pty Ltd				
If a corporation then enter one of the following: ◉ ACN ○ ABN ○ ARBN				653 260 809	
Main phone:	07 3191 8413	Other phone:			
Email:	info@bowencokingcoal.com.au				
Address line 1:	Level 4				
Address line 2:	167 Eagle St				
Town/Suburb:	Brisbane	State:	QLD	Postcode:	4001
Preferred method of contact	○ Phone	○ Email	◉ Letter		

The nominated contact person does not need to be the owner. All verbal and written correspondence (including the issue of notices) will be sent to the nominated contact person.

Name of nominated contact person (if applicable):					
Company name:					
If a corporation then enter one of the following: ○ ACN ○ ABN ○ ARBN					
Main phone:		Other phone:			
Email address:					
Address line 1:					
Address line 2:					
Town/Suburb:		State		Postcode	
Preferred method of contact	○ Phone	○ Email	○ Letter		

I accept that I will act as the nominated contact person on behalf of the owner(s) referred to in Section 1.

Signature of nominated contact person	
Date:	

2. Property description

This is the property on which the declared area is proposed. The declared area management plan should indicate the specific location of the proposed declared area on the property.

Extra pages may be attached to list additional lots.

Lot number	Plan number	Area in hectares	Tenure
11	H4023	868.85	Perpetual lease
12	H4035	1061.693	Perpetual lease

3. Registered interest holder consent

A registered interest is one registered under the *Land Act 1994* or the *Land Title Act 1994*.

Registered interests include but are not limited to mortgages, leases, subleases, covenants, profit a prendres, easements and building management statements.

A declaration may not be made unless the holder of a registered interest (other than the owner) in the proposed declaration area has consented in writing to the making of the declaration.

Note: Registered interest holder consent is not required to lodge this request for a declared area but is required prior to the making of a declaration.

Acknowledgement and waiver by all registered interest holders.

READ BEFORE SIGNING THIS SECTION

By signing this section, those signing are taken to:

- acknowledge that a declaration resulting from this request may have legal and financial implications for your interest in the property, and you agree that in no event shall the Department of Resources be liable for any special, indirect or consequential damages or any damages whatsoever rising out of or in connection with this request or any subsequent declaration in accordance with this request.
- consent to the making of a declaration as proposed in this request and supporting material.

Extra pages may be attached to list additional lots and/or registered interest holders and provide their consent to the making of the declaration.

Parcel (Lot & plan)	Type of registered interest	Registered interest holder's name	Contact details	Signature
11 H4023	Mortgage 721823851	Global Loan Agency Services Aust	Tel: 02 7202 4631	
12 H4035	Mortgage 721823851	Global Loan Agency Services Aust	Tel: 02 7202 4631	
12 H4035	Easement 602802719 (A507)	Powerlink Qld	PO Box 1193, Virginia, 4014	
12 H4035	Easement 602802720 (A970)	Powerlink Qld	PO Box 1193, Virginia, 4014	

4. Type of declaration

Specify the type of declaration that is requested, and the relevant criteria for the declaration. One or more of the criteria may be applicable to the area being sought for declaration.

Note: The owner must provide an explanation of how the declared area meets the criteria selected in this section. This explanation must be provided in the documents accompanying the request.

◉ **Area of high nature conservation value**

- ☐ A wildlife refugium
- ☐ A centre of endemism
- ☑ An area containing a vegetation clump or corridor that contributes to the maintenance of biodiversity
- ☑ An area that makes a significant contribution to the conservation of biodiversity
- ☐ An area that contributes to the conservation value of a wetland, lake or spring
- ☐ Another area that contributes to the conservation of the environment

OR

◯ **An area vulnerable to land degradation**

- ☐ Soil erosion
- ☐ Rising water tables
- ☐ The expression of salinity, whether inside or outside the area
- ☐ Mass movement by gravity of soil or rock
- ☐ Stream bank instability
- ☐ A process that results in declining water quality

4.1 Purpose of request

◯ Vegetation Management Environmental Offset	◯ Better Environmental Outcome (BEO)
◯ Environmental Offset (Queensland)	◯ Other Conservation Purpose
◉ Environmental Offset (Commonwealth)	◯ Enforceable Undertaking
◯ Carbon Offset	

Note: if the purpose of the declaration is to legally secure an exchange area, complete the application to legally secure an exchange area

4.2 Associated development approval

If the declaration is linked to a development approval under the Planning Act (for example, if it required to meet a project condition to legally secure an offset area), please provide details of the development approval below:

Development approval reference number:	EPBC 2013/7064

If the declaration is linked to an approval under another Act please provide details of the approval below:

Other Approval reference number:	EPBC Act
Responsible agency:	Dept of Climate Change, Energy the Environment and Water

5. Management plan

A management plan must be provided with this request for a declared area. The management plan must contain all the components identified in this section. The management plan is to refer to the area identified in Section 2 of this form. The management plan may also include any other information the applicant considers will assist in the determination of the request.

For more information on the management plan, consult the Guide to declared areas, available on www.qld.gov.au.

Management plan checklist

- ☐ Property owner's contact details and signature
- ☐ Includes description of the area subject to the declared area
- ☐ Includes map showing the location and extent of the declared area (or enough information for chief executive to map the stated area):
  - ☐ A map that defines the boundaries of the proposed declared area and a description of the boundaries of the area referenced by Map Grid of Australia 2020 (MGA2020) coordinates and zone references for the area
  - ☐ A map showing the proposed declared area with five or more GPS points that correspond to identifiable fixed features; and the Map Grid of Australia 2020 (MGA2020) coordinates and zone references for each point, acquired by GPS or similar system of satellites that receives and processing information; and a description of the feature that each point represents
  - ☐ A dataset, which can be used in a Geographic Information System showing the proposed declared area
- ☐ States the owner's management intent, and management outcomes proposed by the owner, for the conservation of the high nature conservation value of the area or the prevention of land degradation in the area
- ☐ States the activities the owner intends to carry out, or refrain from carrying out, to achieve the stated management outcomes
- ☐ States the restrictions, if any, to be imposed on the use of, or access to, the area by other persons to achieve the stated management outcomes
- ☐ If the declared area is to legally secure an environmental offset and the Department of Resources is not the administering agency, includes confirmation that the administering agency has / has not approved the declared area management plan that complies with the VMA.

A declared area management plan template / guidance is available at www.qld.gov.au.

6. Signature of owner (applicant) and all registered owners

Where the owner is a company, execution by the company must be provided in accordance with the requirements of the ***Corporations Act 2001 (Commonwealth)***, section 127.

A company:

- may execute a document without using a common seal if the document is signed by two (2) directors of the company or a director and a company secretary; or for a proprietary company that has a sole director who is also the sole company secretary - that director; or
- with a company seal may execute a document if the seal is fixed to the document and the fixing of the seal is witnessed by two (2) directors of the company or a director and a company secretary; or for a proprietary company that has a sole director who is also the sole company secretary - that director.

READ BEFORE SIGNING THIS SECTION

Acknowledgement and waiver by the owner (applicant) and all registered owners.

Before consent to or lodging this request for a declared area, it is recommended that all registered owners of the property seek their own independent legal and financial advice regarding the effect of this request, and the legal and financial impacts of any subsequent declaration.

By signing this section, those signing are taken to:

- acknowledge that the declared area resulting from this request may have legal and financial implications for your interest in the property, and you agree that in no event shall the Department of Resources be liable for any damages whatsoever rising out of or in connection with this request or any subsequent declaration; and
- consent to the lodgment of the request; and
- agree that all information entered and provided in this request, including any maps, lists or other documents additionally supplied, is correct and accurate; and
- authorise the nominated contact person to act as such on your behalf; and
- authorise all verbal correspondence relating to this request to be to the nominated contact person; and
- authorise all written correspondence (including the issuing of notices) relating to this request to be sent to the postal address for the nominated contact person; and
- request that the chief executive agree to make a declaration as proposed in this request.

If there are more owners, extra pages containing the additional signature(s) may be attached.

Lot	Plan number	Owner's name	If a corporation record one of the following:		Owner's signature	Date	Company seal *(if applicable)*
11	H4023	Bowen PCI Pty Ltd	(●) ACN ( ) ARBN	653 260 809			
12	H4035	Bowen PCI Pty Ltd	(●) ACN ( ) ARBN	653 260 809			
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				
			( ) ACN ( ) ARBN				

Privacy statement: The Department of Resources is collecting the information in this form and any attachments to process your request that the chief executive declare a stated area of land under the *Vegetation Management Act 1999*. The consideration of your request may involve consultation, and if so, details of your request and any attachments may be disclosed to third parties. These details will not otherwise be disclosed outside the Department of Resources unless required or authorized by law.

Office use only

Name:		Position:		Date received	
Signature		Date:			

Schedule 1.4: Declared Area Management Plan – Colorado

Queensland Government

Department of Resources
ABN 59 020 847 551

Declared area management plan

Vegetation Management Act 1999

Complete the following management plan for an area to be declared as an area of high nature conservation value or an area vulnerable to land degradation.

For guidance on declared areas see the Guide to declared areas (hyperlink). For guidance on legally securing an exchange area see the General guide to accepted development vegetation clearing codes.

Note: Examples of information to include in this management plan are intended as guidance only. The level of detail or scope of the management plan will depend on the purpose of the declaration and the particular circumstances of the area being secured.

1. Owner's details

First name:		Middle name:		Surname:	
Company name:	Bowen PCI Pty Ltd				
If a corporation then enter one of the following:	(●) ACN ( ) ABN ( ) ARBN			653 260 809	
Main phone:	07 3191 8413	Other phone:			
Address line 1:	Level 4				
Address line 2:	167 Eagle St				
Town/Suburb:	Brisbane	State:	QLD	Postcode:	4001
Email address:	info@bowencokingcoal.com.au				
Preferred method of contact		( ) Phone	( ) Email	(●) Letter	
Local government area:	Central Highlands Regional Council				
Office use only:					
eLVAS case number:					
Notification number:					

2. Property description

This is the property on which the declared area is proposed. The declared area management plan should indicate the specific location of the proposed declared area on the property.

Extra pages may be attached to list additional lots.

Lot number	Plan number	Declared area in hectares	Tenure
11	H4023		Perpetual lease
12	H4035		Perpetual lease

3. Description of declared area

Include enough information to allow the chief executive to map the boundary of the stated area, including a description of the area subject to the declared area and a map showing the location and extent of the area.

Please refer to section 6 of the document titled "Bowen Coking Coal: Bluff Coal Mine Project EPBC 2013/7064 Biodiversity Offset Management Plan" (BOMP)

A map may be attached to this plan and submitted with the request for a declared area. Please provide spatial data in the format of a .klm or .shp file of your proposed area so that the exact extent can be used for the assessment.

4. Purpose of the declaration

The purpose of this declaration is to conserve an area of:

(●) high nature conservation value

( ) vulnerable to land degradation

under section 19G(1)(b)(iii) of the *Vegetation Management Act 1999* (VMA)

5. Registered interest holders consent

A registered interest is one registered under the *Land Act 1994* or the *Land Title Act 1994*.

Registered interests include mortgages, leases, subleases, covenants, profit a prendres, easements and building management statements.

A declaration may not be made unless the holder of a registered interest (other than the owner) in the proposed declaration area has consented in writing to the making of the declaration.

READ BEFORE SIGNING THIS SECTION

Acknowledgement and waiver by all registered interest holders.

By signing this section, those signing are taken to:

- acknowledge that a declared area resulting from a request for a declared area may have legal and financial implications for your interest in the property, and you agree that in no event shall the Department of Resources be liable for any special, indirect or consequential damages or any damages whatsoever rising out of or in connection with a request for a declared area or any subsequent declaration of the area in accordance with the request for a declared area.
- consent to the making of a declared area as proposed in the request for a declared area.

Extra pages may be attached to list additional lots and/or registered interest holders and provide their consent to the making of the declaration

Parcel (Lot & plan)	Type of registered interest	Registered interest holder's name	Contact details	Signature
11 H4023	Mortgage 721823851	Global Loan Agency Services Aust	Tel: 02 7202 4631	
12 H4035	Mortgage 721823851	Global Loan Agency Services Aust	Tel: 02 7202 4631	
12 H4035	Easement 602802719 (A507)	Powerlink Qld	PO Box 1193, Virginia, 4014	
12 H4035	Easement 602802720 (A970)	Powerlink Qld	PO Box 1193, Virginia, 4014	

Principles for drafting management plan: *In the sections below you will need to outline how you will achieve the management outcomes, including details on what actions will be taken to achieve this and how you will mitigate any impacts and manage any potential risks that may hinder the specified outcome.*

6. Management intent

Refer to section 8 and section 9 of the BOMP

Examples:

1. *The management intent for the area is the conservation of the native vegetation in the area. Conservation of the native vegetation will prevent the loss of biodiversity and maintain ecological processes.*
2. *The management intent for an area vulnerable to land degradation is to rehabilitate a degraded, unstable watercourse in an area subject to stream bank instability.*

7. Management outcome

Refer to section 8 and section 9 of the BOMP

Principles for drafting management outcomes: *The management outcomes for the area should be achievable, measurable and related to the to the conservation value or land degradation issue associated with the area.*

Examples:

1. *The management outcome for the area is that it achieves the definition of remnant vegetation.*
2. *The management outcome for the area is to establish (insert number) habitat trees and to have restored and enhanced (insert hectares) of natural area within (insert number) of years.*

Note for exchange areas: If the declaration is to legally secure an exchange area, the management objective must be either of the following:

i. If the exchange area is located in a category X area, category C area or category R area—to return the exchange area to remnant vegetation (a category B area on the regulated vegetation management map) as soon as possible and within 20 years

ii. If the exchange area is located in a category B area—to achieve the nominated substantial conservation outcome or address the nominated significant land degradation issue as soon as possible

8. Activities and restrictions

Refer to section 8 of the BOMP

Example: To achieve the management outcome, the landholder will comply with the following activities and restrictions:

1. *Clearing of native vegetation will not occur unless in accordance with an exemption listed in Schedule 21 of the Planning Regulation 2017 or a development approval under the Planning Act 2016.*
2. *All reasonable measures will be taken to maintain and enhance the structure and function of the regional ecosystem. For example, minimizing the introduction, establishment and spread of non-native plants. Where non-native plants already occur in the area, all reasonable measures will be taken to control the non-native plants.*
3. *Burning will only occur in accordance with the fire guideline/s specified in the Regional ecosystem description database (available at www.qld.gov.au) for the regional ecosystem/s in the declared area.*
4. *Pest animals and pest plants considered an invasive biosecurity matter under the Biosecurity Act 2014 will be controlled.*
5. *Livestock will be managed to ensure the growth of native vegetation and biodiversity is not impeded.*

Note for exchange areas: If the declaration is to legally secure an exchange area, this section of the management plan must include:

- Description of the works / management actions that will be undertaken to achieve the management objective, including the methods, timing, frequency, intended benefits etc.
- The conservation outcomes that will be achieved by the works / management actions
- Description of the management actions that will be undertaken to ensure that the effects of the works do not result in land degradation
- Details of who is responsible for all works and management actions, and the estimated length of time the area/s will be managed

9. Term

A management plan for a declared area has effect until the earlier of the following happens:

- the plan ends under its terms; or
- the declaration of the area as a declared area ends under section 19L of the VMA

Refer to section 9 of the BOMP

Ending a declaration

Under section 19L of the VMA the chief executive may, by written notice given to the owner of the land the subject of a declaration, end the declaration if the chief executive considers:

- the declaration is not in the interests of the State, having regard to the public interest; or
- the management outcomes mentioned in section 19E(3)(c) of the VMA for the management plan relevant to the declaration have been achieved.

The chief executive may, by notice given to the owner of land declared as an area of high conservation value, end the declaration if:

- the area is, on or after the commencement of subsection 19L(2) of the VMA, a legally secured offset area; and
- a prescribed activity is, under an authority under another Act, to be carried out in or on the area; and
- the holder of the authority has entered into an agreed delivery arrangement in relation to an environmental offset for impacts to the area.

Note: If the landholder considers the management outcomes have been achieved, they may submit a request to end a declaration to the Department of Resources. The Department of Resources will assess whether the management outcomes have been met before removing the declaration. If the declaration is to legally secure an environmental offset and the Department of Resources is not the administering agency, the department should also be satisfied that the administering agency agrees the management outcomes have been met and agrees to the ending of the declaration in order for the department to end the declaration.

Once the declaration has ended this plan will cease to have effect and the department will remove the declaration notice from the title of the land. The landholder should submit a 20C PMAV application with the request to remove the declaration to replace the PMAV currently over the declared area and map the appropriate category of vegetation for the area (for example, category B).

10. Monitoring and record keeping

Refer to section 10 of the BOMP

Monitoring and record keeping should be undertaken to track the state of the declared area and progress towards achieving the management outcomes specified in this plan. The following information should also be provided:

- Monitoring and auditing processes including adaptive management approaches to rectify negative results from the monitoring and auditing processes
- Record keeping process for retaining appropriate records for monitoring and auditing processes.

Note: Providing the information above complies with the ADVCC requirements for legally securing an exchange area.

To apply for an area to be legally secured as an exchange area, complete the application to legally secure an exchange area. For guidance on legally securing an exchange area see the General guide to accepted development vegetation clearing codes.

11. Additional information

The management plan may also include any other information the applicant considers will assist in the determination of the request. Additional information can be provided below or as an attachment to this plan.

12. Administering agency approval

If you are using a declared area to legally secure an environmental offset and the Department of Resources is not the administering agency, has the administering agency approved this management plan?

- ○ Yes – Please include a copy of this approval with the request
- ◉ No – Please provide contact information for the administering agency and details of the offset delivery progress

Note: this management plan complies with the requirements for a declared area under the VMA, it does not fulfil the requirements of an offset management plan.

13. Signature of owner (applicant) and all registered owners

If there is more than one owner of the land on which the declared area is proposed, each owner must complete and sign this management plan. The owner of the land is the party/s registered on title as the registered owner.

Where the owner is a company, execution by the company must be provided in accordance with the requirements of the ***Corporations Act 2001 (Commonwealth)***, section 127.

A company:

- may execute a document without using a common seal if the document is signed by two (2) directors of the company or a director and a company secretary; or for a proprietary company that has a sole director who is also the sole company secretary - that director; or
- with a company seal may execute a document if the seal is fixed to the document and the fixing of the seal is witnessed by two (2) directors of the company or a director and a company secretary; or for a proprietary company that has a sole director who is also the sole company secretary - that director.

If there are more owners, extra pages containing the additional signature(s) may be attached.

Lot	Plan number	Owner's name	If a corporation record one of the following:		Owner's signature	Date	Company seal *(if applicable)*
11	H4023	Bowen PCI Pty Ltd	◉ ACN ○ ARBN	653 260 809			
12	H4035	Bowen PCI Pty Ltd	◉ ACN ○ ARBN	653 260 809			
			○ ACN ○ ARBN				
			○ ACN ○ ARBN				
			○ ACN ○ ARBN				
			○ ACN ○ ARBN				
			○ ACN ○ ARBN				
			○ ACN ○ ARBN				
			○ ACN ○ ARBN				

Department of Resources *(office use only)*							
Name		**Position**		**Signature**		**Date**	

Appendix A: Offset Assessment Guide outputs

Appendix A1: OAG output – koala (remnant)

Matter of National Environmental Significance

Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction	0.2%

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to	Description	Quantum of impact		Information source
Area of communi	No		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*			

Threatened species habitat

Protected matter attributes	Attribute relevant to	Description	Quantum of impact		Information source
Area of habitat	Yes		Area *(Hectares)*	248.94	
			Quality *(Scale 0-10)*	6	
		Total quantum of impact *(Adjusted Hectares)*		149.36	

Protected matter attributes	Attribute relevant to	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no	No			

Threatened species

Protected matter attributes	Attribute relevant to	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to	Total quantum of impact *(Adjusted*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted*	Offset Result		Cost *($ total)*	Information source
Area of communi	Yes			Risk-related time horizon *(max 20)*		Start area *(hectares)*		Risk of loss without offset		Risk of loss with offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00		
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality without offset		Future quality with offset *(scale of 0-*		0.00		0.00	0.00	% of impact offset	0.00%		
								Future area without	0.0	Future area with offset	0.0			Minimum (90%) direct offset requirement met?		FALSE			

Threatened species habitat

Protected matter attributes	Attribute relevant to	Total quantum of impact *(Adjusted*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted*	Offset Result		Cost *($ total)*	Information source
Area of habitat	Yes	149.36	Remnant 11.5.2 670.6h	Risk-related time horizon *(max 20)*	20	Start area *(hectares)*	667.8	Risk of loss without offset	8%	Risk of loss with offset *(%)*	0%	53.42	100%	53.42	51.33	Overall net present value	136.28		
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	5	Future quality without offset	5	Future quality with offset *(scale of 0-*	7	2.00	85%	1.70	1.63	% of impact offset	91.24%		
								Future area without	614.4	Future area with offset	667.8			Minimum (90%) direct offset requirement met?		TRUE			

Protected matter attributes	Attribute relevant to	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement	Cost *($ total)*	Information source
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE		
Condition of habitat Change in habitat condition, but no	No							0.00		0.00	0.00	0.00%	FALSE		

Threatened species

Protected matter attributes	Attribute relevant to	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement	Cost *($ total)*	Information source
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE		
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE		
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE		

Appendix A2: OAG output – koala (regrowth)

Matter of National Environmental Significance

Name	Koala
EPBC Act status	Vulnerable
Annual probability of extinction	0.2%

Impact calculator

Ecological communities

Protected matter attributes	Attribute relevant to	Description	Quantum of impact		Information source
Area of communi	No		Area *(Hectares)*		
			Quality *(Scale 0-10)*		
		Total quantum of impact *(Adjusted Hectares)*			

Threatened species habitat

Protected matter attributes	Attribute relevant to	Description	Quantum of impact		Information source
Area of habitat	Yes		Area *(Hectares)*	248.94	
			Quality *(Scale 0-10)*	6	
		Total quantum of impact *(Adjusted Hectares)*		149.36	

Protected matter attributes	Attribute relevant to	Description	Quantum of impact	Information source
Number of features e.g. Nest hollows, habitat trees	No			
Condition of habitat Change in habitat condition, but no	No			

Threatened species

Protected matter attributes	Attribute relevant to	Description	Quantum of impact	Information source
Birth rate e.g. Change in nest success	No			
Mortality rate e.g Change in number of road kills per year	No			
Number of individuals e.g. Individual plants/animals	No			

Offset calculator

Ecological Communities

Protected matter attributes	Attribute relevant to	Total quantum of impact *(Adjusted*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted*	Offset Result		Cost *($ total)*	Information source
Area of communi	Yes			Risk-related time horizon *(max. 20*		Start area *(hectares)*		Risk of loss without offset		Risk of loss with offset *(%)*		0.00		0.00	0.00	Overall net present value	0.00		
				Time until ecological benefit		Start quality *(scale of 0-10)*		Future quality without offset		Future quality with offset *(scale of 0-*		0.00		0.00	0.00	% of impact offset	0.00%		
								Future area without	0.0	Future area with offset	0.0			Minimum (90%) direct offset requirement met?		FALSE			

Threatened species habitat

Protected matter attributes	Attribute relevant to	Total quantum of impact *(Adjusted*	Proposed offset	Time Horizon *(Years)*		Start area and quality		Future area and quality without offset *(adjusted hectares)*		Future area and quality with offset *(adjusted hectares)*		Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value *(adjusted*	Offset Result		Cost *($ total)*	Information source
Area of habitat	Yes	149.36	Regrowth 11.5.2 207.7	Risk-related time horizon *(max. 20*	20	Start area *(hectares)*	207.6	Risk of loss without offset	8%	Risk of loss with offset *(%)*	0%	16.61	100%	16.61	15.96	Overall net present value	42.37		
				Time until ecological benefit	20	Start quality *(scale of 0-10)*	5	Future quality without offset	5	Future quality with offset *(scale of 0-*	7	2.00	85%	1.70	1.63	% of impact offset	28.36%		
								Future area without	191.0	Future area with offset	207.6			Minimum (90%) direct offset requirement met?		FALSE			

Protected matter attributes	Attribute relevant to	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement	Cost *($ total)*	Information source
Number of features e.g. Nest hollows, habitat trees	No							0.00		0.00	0.00	0.00%	FALSE		
Condition of habitat Change in habitat condition, but no	No							0.00		0.00	0.00	0.00%	FALSE		

Threatened species

Protected matter attributes	Attribute relevant to	Quantum of impact	Proposed offset	Time horizon *(years)*	Start Value	Future value without offset	Future value with offset	Raw gain	Confidence in result *(%)*	Adjusted gain	Net present value	% of impact offset	Minimum (90%) direct offset requirement	Cost *($ total)*	Information source
Birth rate e.g. Change in nest success	No							0.00		0.00	0.00	0.00%	FALSE		
Mortality rate e.g Change in number of road kills per year	No							0.00		0.00	0.00	0.00%	FALSE		
Number of individuals e.g. Individual plants/animals	No							0.00		0.00	0.00	0.00%	FALSE		

Appendix B: Detailed habitat quality assessment tables

Appendix B1: Impact assessment table – koala habitat

Assessment table for impact to fauna habitat	**Assessment unit:**	**Bench-mark (BM)**	11.3.25			**BM**	11.5.3			**BM**	11.5.2			**BM**	11.5.2a		
	Property:		Bluff Coal				Bluff Coal				Bluff Coal				Bluff Coal		
	Assessment site no:		EEM03				EEM05				EEM02				EEM04		
	Regional ecosystem:	**11.3.25**	11.3.25			**11.5.3**	11.5.3			**11.5.2**	11.5.2			**11.5.2a**	11.5.2a		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.):	Trees	**4**	4	100%	5	**6**	3	50%	2.5	**5**	2	40%	2.5	**3**	4	133%	5
	Shrubs	**4**	10	250%	5	**6**	6	100%	5	**10**	2	20%	0	**7**	3	43%	2.5
	Grasses	**8**	12	150%	5	**6**	15	250%	5	**9**	17	189%	5	**11**	16	145%	5
	Forbs	**13**	7	54%	2.5	**10**	13	130%	5	**16**	25	156%	5	**14**	20	143%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**23**	15	65%	3	**16**	12	75%	5	**20**	15	75%	5	**10.5**	8	76%	5
Tree sub-canopy height		**11**	0	0%	0	**0**	8			**9**	11	122%	5	**7**	5	71%	5
Average score					1.5				5.0				5.0				5
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**34**	59.7	176%	5	**20**	20	100%	5	**24**	32	133%	5	**35**	49.4	141%	5
Tree sub-canopy cover		**12**	0	0%	0	**0**	7.5			**13**	6.2	48%	2	**15**	2.4	16%	2
Average score					2.5				5.0				3.5				3.5
Shrub canopy cover (%):		**7**	6.1	87%	5	**3**	10	333%	3	**7**	5	71%	5	**4**	5	125%	5
Native perennial grass cover (%):		**35**	29.6	85%	3	**19**	45	237%	5	**38**	28	74%	3	**5**	11.4	228%	5
Organic litter (%):		**21**	9	43%	3	**20**	49.4	247%	3	**25**	15.8	63%	5	**55**	61.2	111%	5
Large trees/ha (euc./non-euc. combined)		**32**	14	44%	5	**10**	0	0%	0	**14**	30	214%	15	**30**	34	113%	15
Coarse woody debris (m/ha)		**473**	280	59%	5	**314**	525	167%	5	**240**	255	106%	5	**600**	355	59%	5
Non-native plant cover (%):		**0**	0.42	42%	3	**0**	0	0%	10	**0**	0.01	1%	10	**0**	0	0%	10
Quality/availability of food/foraging habitat (-/25)					25.0				2.5				2.5				2.5
Quality/availability of shelter (-/25)					12.5				12.5				12.5				2.5
Site condition score (-/130)					**88.0**				**73.5**				**84.0**				**81**
Size of patch (fragmented) (-/10)					10				5				10				10
Context (fragmented) (-/5)					4				2				5				4
Connectedness (fragmented) (-/5)					4				2				4				4
Species mobility capacity (-/25)					25				25				25				17.5
Threats to the species (-/25)					11.67				25				25				11.7
Site context score (-/70)					**54.67**				**59.0**				**69.0**				**47.16**
Assessment unit totals																	
AU site condition score (-/3):					2.03				1.70				1.94				2.43
AU site context score (-/3):					2.34				2.53				2.96				2.02
AU species stocking rate (-/4):					0.86				0.86				0.86				0.86
AU habitat quality score (-/10):					**5.23**				**53.08**				**5.75**				**5.31**
AU area within impact area:					10.32				7.15				219.82				11.65
248.94					248.94				248.94				248.94				248.94
Area weighting:					0.04				0.03				0.88				0.05
AU weighted HQS:					**0.22**				**0.15**				**5.08**				**0.25**

Appendix B2: Offset assessment table – koala – current quality

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	11.5.2 HVR			**BM**	11.5.2 HVR			**BM**	11.5.2a RV			**BM**	11.5.2a RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV		
	Property:		Colorado				Colorado				Colorado				Colorado				Colorado				Colorado		
	Assessment site no:		HQP12				HQP13				HQP14				HQP16				HQP1				HQP3		
	Regional ecosystem:	**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2a**	11.5.2a			**11.5.2a**	11.5.2a			**11.5.2**	11.5.2			**11.5.2**	11.5.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	80	80%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**5**	3	60%	2.5	**5**	5	100%	5	**3**	4	133%	5	**3**	5	167%	5	**5**	4	80%	2.5	**5**	6	120%	5
Shrubs		**10**	6	60%	2.5	**10**	6	60%	2.5	**7**	8	114%	5	**7**	10	143%	5	**10**	8	80%	2.5	**10**	6	60%	2.5
Grasses		**9**	11	122%	5	**9**	10	111%	5	**11**	12	109%	5	**11**	10	91%	5	**9**	8	89%	2.5	**9**	7	78%	2.5
Forbs		**16**	15	94%	5	**16**	7	44%	2.5	**14**	14	100%	5	**14**	15	107%	5	**16**	2	13%	0	**16**	7	44%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**20**	16.7	84%	5	**20**	15	75%	5	**10.5**	10	95%	5	**10.5**	11.4	109%	5	**20**	17	85%	5	**20**	16.4	82%	5
Tree sub-canopy height		**9**	10.3	114%	5	**9**	8.6	80%	5	**7**	5.6	80%	5	**7**	8.2	117%	5	**9**	0	0%	0	**9**	8.7	97%	5
Average score					5				5				5				5				2.5				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**24**	18.8	78%	5	**24**	46.9	195%	5	**35**	43.6	125%	5	**35**	16.8	48%	2	**24**	16.9	70%	5	**24**	27.1	113%	5
Tree sub-canopy cover		**13**	17.7	136%	5	**13**	10.8	83%	5	**15**	20.2	135%	5	**15**	15.6	104%	5	**13**	0	0%	0	**13**	34.6	266%	3
Average score					5				5				5				3.5				2.5				4.0
Shrub canopy cover (%):		**7**	12.9	184%	5	**7**	15.7	224%	3	**4**	2.2	55%	5	**4**	9.3	233%	3	**7**	3.5	50%	5	**7**	37	529%	3
Native perennial grass cover (%):		**38**	17	45%	1	**38**	22.4	59%	3	**5**	4.8	96%	5	**5**	6.6	132%	5	**38**	2.4	6%	0	**38**	9.2	24%	1
Organic litter (%):		**25**	24	96%	5	**25**	48.4	194%	5	**55**	40.4	73%	5	**55**	73	133%	5	**25**	65.6	262%	3	**25**	42	168%	5
Large trees/ha (euc./non-euc. combined)		**14**	3	21%	5	**14**	2	14%	5	**30**	25	83%	10	**30**	13	43%	5	**14**	9	64%	10	**14**	13	93%	10
Coarse woody debris (m/ha)		**240**	365	152%	5	**240**	285	119%	5	**600**	630	105%	5	**600**	520	87%	5	**240**	245	102%	5	**240**	185	77%	5
Non-native plant cover (%):		**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0	0%	10	**0**	0.014	1%	10	**0**	0.01	1%	10	**0**	0.01	1%	10
Quality/availability of food/foraging habitat (-/25)					2.5				2.5				2.5				2.5				2.5				2.5
Quality/availability of shelter (-/25)					12.5				12.5				2.5				2.5				12.5				12.5
Site condition score (-/130)					**76.0**				**76.0**				**80.0**				**71.5**				**65.5**				**75.5**
Size of patch (fragmented) (-/10)					7				7				0				0				0				0
Context (fragmented) (-/5)					2				2				2				2				5				5
Connectedness (fragmented) (-/5)					4				4				4				4				5				5
Species mobility capacity (-/25)					17.5				17.5				17.5				17.5				25				25
Threats to the species (-/25)					12				12				12				12				25				25
Site context score (-/70)					**42.0**				**42.0**				**35.0**				**35.0**				**60.0**				**60.0**
Assessment unit totals																									
AU site condition score (-/3):									1.59								1.59								
AU site context score (-/3):									1.81								1.81								
AU species stocking rate (-/4):									0.57								0.57								
AU habitat quality score (-/10):									**3.97**								**3.67**								
AU area within offset area:									207.6								81.5								
Total offset area for this MNES:									875.5								875.5								
Area weighting:									0.24								0.09								
AU weighted HQS:									**0.98**								**0.36**								

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV		
	Property:		Colorado				Colorado				Colorado				Colorado				Colorado				Colorado		
	Assessment site no:		HQP5				HQP6				HQP8				HQP11				HQP20				HQP17		
	Regional ecosystem:	**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	50	50%	3	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.):	Trees	**5**	7	140%	5	**5**	5	100%	5	**5**	2	40%	2.5	**5**	7	140%	5	**5**	4	80%	2.5	**5**	3	60%	2.5
	Shrubs	**10**	9	90%	5	**10**	12	120%	5	**10**	3	30%	2.5	**10**	8	80%	2.5	**10**	8	80%	2.5	**10**	3	30%	2.5
	Grasses	**9**	7	78%	2.5	**9**	12	133%	5	**9**	13	144%	5	**9**	13	144%	5	**9**	12	133%	5	**9**	12	133%	5
	Forbs	**16**	7	44%	2.5	**16**	16	100%	5	**14**	10	63%	2.5	**14**	7	44%	2.5	**16**	8	50%	2.5	**16**	19	119%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**20**	13.6	68%	3	**20**	14	70%	5	**18**	15	75%	5	**18**	14.1	71%	5	**20**	14.5	73%	5	**20**	15.8	79%	5
Tree sub-canopy height		**9**	6.8	76%	5	**9**	6.4	71%	5	**10**	7.7	86%	5	**10**	7.5	83%	5	**9**	9.7	108%	5	**9**	9	100%	5
Average score					4.0				4.0				5.0				5.0				5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**24**	26.9	112%	5	**24**	26.5	110%	5	**24**	11.8	49%	2	**24**	47.8	199%	5	**24**	23	96%	5	**24**	46.4	193%	5
Tree sub-canopy cover		**13**	31	238%	3	**13**	19.4	149%	5	**13**	28.5	219%	3	**13**	32.5	250%	3	**13**	24.6	189%	5	**13**	2.6	20%	2
Average score					4.0				5.0				2.5				4.0				5.0				3.5
Shrub canopy cover (%):		**7**	8.5	121%	5	**7**	17	243%	3	**7**	23.2	331%	3	**7**	8.6	123%	5	**7**	13.4	191%	5	**7**	3.3	47%	3
Native perennial grass cover (%):		**38**	4.6	12%	1	**38**	7	18%	1	**38**	13.6	36%	1	**38**	19.4	51%	3	**38**	6	16%	1	**38**	18.2	48%	1
Organic litter (%):		**25**	51.8	207%	3	**25**	46	184%	5	**25**	69.4	278%	3	**25**	9	36%	3	**25**	10.2	41%	3	**25**	58.4	234%	3
Large trees/ha (euc./non-euc. combined)		**14**	36	257%	15	**14**	18	129%	15	**14**	13	93%	10	**14**	16	114%	15	**14**	22	157%	15	**14**	1	7%	5
Coarse woody debris (m/ha)		**240**	642	268%	2	**240**	925	385%	2	**240**	275	115%	5	**240**	145	60%	5	**240**	580	242%	2	**240**	585	244%	2
Non-native plant cover (%):		**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0.048	5%	10	**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0.01	1%	10
Quality/availability of food/foraging habitat (-/25)					2.5				2.5				2.5				2.5				2.5				2.5
Quality/availability of shelter (-/25)					12.5				12.5				12.5				12.5				12.5				12.5
Site condition score (-/130)					**79.0**				**86.0**				**72.0**				**83.0**				**78.5**				**67.5**
Size of patch (fragmented) (-/10)					5				5				10				10				10				0
Context (fragmented) (-/5)					5				5				5				5				4				4
Connectedness (fragmented) (-/5)					5				5				5				5				4				4
Species mobility capacity (-/25)					25				25				25				25				17.5				17.5
Threats to the species (-/25)					25				25				25				25				12				12
Site context score (-/70)					**65.0**				**65.0**				**70.0**				**70.0**				**47.0**				**37.0**
Assessment unit totals																									
AU site condition score (-/3):																									1.75
AU site context score (-/3):																									2.54
AU species stocking rate (-/4):																									0.57
AU habitat quality score (-/10):																									**4.86**
AU area within offset area:																									586.3
Total offset area for this MNES:																									875.5
Area weighting:																									0.67
AU weighted HQS:																									**3.26**

Appendix B3: Offset assessment table – koala – future quality without offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	11.5.2 HVR			**BM**	11.5.2 HVR			**BM**	11.5.2a RV			**BM**	11.5.2a RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV		
	Property:		Colorado				Colorado				Colorado				Colorado				Colorado				Colorado		
	Assessment site no:		HQP12				HQP13				HQP14				HQP16				HQP1				HQP3		
	Regional ecosystem:	**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2a**	11.5.2a			**11.5.2a**	11.5.2a			**11.5.2**	11.5.2			**11.5.2**	11.5.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	80	80%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**5**	3	60%	2.5	**5**	5	100%	5	**3**	4	133%	5	**3**	5	167%	5	**5**	4	80%	2.5	**5**	6	120%	5
Shrubs		**10**	6	60%	2.5	**10**	6	60%	2.5	**7**	8	114%	5	**7**	10	143%	5	**10**	8	80%	2.5	**10**	6	60%	2.5
Grasses		**9**	11	122%	5	**9**	10	111%	5	**11**	12	109%	5	**11**	10	91%	5	**9**	8	89%	2.5	**9**	7	78%	2.5
Forbs		**16**	15	94%	5	**16**	7	44%	2.5	**14**	14	100%	5	**14**	15	107%	5	**16**	2	13%	0	**16**	7	44%	2.5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**20**	16.7	84%	5	**20**	15	75%	5	**10.5**	10	95%	5	**10.5**	11.4	109%	5	**20**	17	85%	5	**20**	16.4	82%	5
Tree sub-canopy height		**9**	10.3	114%	5	**9**	8.6	80%	5	**7**	5.6	80%	5	**7**	8.2	117%	5	**9**	0	0%	0	**9**	8.7	97%	5
Average score					5				5				5				5				2.5				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**24**	18.8	78%	5	**24**	46.9	195%	5	**35**	43.6	125%	5	**35**	16.8	48%	2	**24**	16.9	70%	5	**24**	27.1	113%	5
Tree sub-canopy cover		**13**	17.7	136%	5	**13**	10.8	83%	5	**15**	20.2	135%	5	**15**	15.6	104%	5	**13**	0	0%	0	**13**	34.6	266%	3
Average score					5				5				5				3.5				2.5				4.0
Shrub canopy cover (%):		**7**	12.9	184%	5	**7**	15.7	224%	3	**4**	2.2	55%	5	**4**	9.3	233%	3	**7**	3.5	50%	5	**7**	37	529%	3
Native perennial grass cover (%):		**38**	17	45%	1	**38**	22.4	59%	3	**5**	4.8	96%	5	**5**	6.6	132%	5	**38**	2.4	6%	0	**38**	9.2	24%	1
Organic litter (%):		**25**	24	96%	5	**25**	48.4	194%	5	**55**	40.4	73%	5	**55**	73	133%	5	**25**	65.6	262%	3	**25**	42	168%	5
Large trees/ha (euc./non-euc. combined)		**14**	3	21%	5	**14**	2	14%	5	**30**	25	83%	10	**30**	13	43%	5	**14**	9	64%	10	**14**	13	93%	10
Coarse woody debris (m/ha)		**240**	365	152%	5	**240**	285	119%	5	**600**	630	105%	5	**600**	520	87%	5	**240**	245	102%	5	**240**	185	77%	5
Non-native plant cover (%):		**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0	0%	10	**0**	0.014	1%	10	**0**	0.01	1%	10	**0**	0.01	1%	10
Quality/availability of food/foraging habitat (-/25)					2.5				2.5				2.5				2.5				2.5				2.5
Quality/availability of shelter (-/25)					12.5				12.5				2.5				2.5				12.5				12.5
Site condition score (-/130)					**76.0**				**76.0**				**80.0**				**71.5**				**65.5**				**75.5**
Size of patch (fragmented) (-/10)					7				7				0				0				0				0
Context (fragmented) (-/5)					2				2				2				2				5				5
Connectedness (fragmented) (-/5)					4				4				4				4				5				5
Species mobility capacity (-/25)					17.5				17.5				17.5				17.5				25				25
Threats to the species (-/25)					12				12				12				12				25				25
Site context score (-/70)					**42.0**				**42.0**				**35.0**				**35.0**				**60.0**				**60.0**
Assessment unit totals																									
AU site condition score (-/3):									1.59								1.59								
AU site context score (-/3):									1.81								1.81								
AU species stocking rate (-/4):									0.57								0.57								
AU habitat quality score (-/10):									**3.97**								**3.67**								
AU area within offset area:									207.6								81.5								
Total offset area for this MNES:									875.5								875.5								
Area weighting:									0.24								0.09								
AU weighted HQS:									**0.98**								**0.36**								

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV		
	Property:		Colorado				Colorado				Colorado				Colorado				Colorado				Colorado		
	Assessment site no:		HQP5				HQP6				HQP8				HQP11				HQP20				HQP17		
	Regional ecosystem:	**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)		**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	50	50%	3	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees		**5**	7	140%	5	**5**	5	100%	5	**5**	2	40%	2.5	**5**	7	140%	5	**5**	4	80%	2.5	**5**	3	60%	2.5
Shrubs		**10**	9	90%	5	**10**	12	120%	5	**10**	3	30%	2.5	**10**	8	80%	2.5	**10**	8	80%	2.5	**10**	3	30%	2.5
Grasses		**9**	7	78%	2.5	**9**	12	133%	5	**9**	13	144%	5	**9**	13	144%	5	**9**	12	133%	5	**9**	12	133%	5
Forbs		**16**	7	44%	2.5	**16**	16	100%	5	**14**	10	63%	2.5	**14**	7	44%	2.5	**16**	8	50%	2.5	**16**	19	119%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer		**20**	13.6	68%	3	**20**	14	70%	5	**18**	15	75%	5	**18**	14.1	71%	5	**20**	14.5	73%	5	**20**	15.8	79%	5
Tree sub-canopy height		**9**	6.8	76%	5	**9**	6.4	71%	5	**10**	7.7	86%	5	**10**	7.5	83%	5	**9**	9.7	108%	5	**9**	9	100%	5
Average score					4.0				4.0				5.0				5.0				5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer		**24**	26.9	112%	5	**24**	26.5	110%	5	**24**	11.8	49%	2	**24**	47.8	199%	5	**24**	23	96%	5	**24**	46.4	193%	5
Tree sub-canopy cover		**13**	31	238%	3	**13**	19.4	149%	5	**13**	28.5	219%	3	**13**	32.5	250%	3	**13**	24.6	189%	5	**13**	2.6	20%	2
Average score					4.0				5.0				2.5				4.0				5.0				3.5
Shrub canopy cover (%):		**7**	8.5	121%	5	**7**	17	243%	3	**7**	23.2	331%	3	**7**	8.6	123%	5	**7**	13.4	191%	5	**7**	3.3	47%	3
Native perennial grass cover (%):		**38**	4.6	12%	1	**38**	7	18%	1	**38**	13.6	36%	1	**38**	19.4	51%	3	**38**	6	16%	1	**38**	18.2	48%	1
Organic litter (%):		**25**	51.8	207%	3	**25**	46	184%	5	**25**	69.4	278%	3	**25**	9	36%	3	**25**	10.2	41%	3	**25**	58.4	234%	3
Large trees/ha (euc./non-euc. combined)		**14**	36	257%	15	**14**	18	129%	15	**14**	13	93%	10	**14**	16	114%	15	**14**	22	157%	15	**14**	1	7%	5
Coarse woody debris (m/ha)		**240**	642	268%	2	**240**	925	385%	2	**240**	275	115%	5	**240**	145	60%	5	**240**	580	242%	2	**240**	585	244%	2
Non-native plant cover (%):		**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0.048	5%	10	**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0.01	1%	10
Quality/availability of food/foraging habitat (-/25)					2.5				2.5				2.5				2.5				2.5				2.5
Quality/availability of shelter (-/25)					12.5				12.5				12.5				12.5				12.5				12.5
Site condition score (-/130)					**79.0**				**86.0**				**72.0**				**83.0**				**78.5**				**67.5**
Size of patch (fragmented) (-/10)					5				5				10				10				10				0
Context (fragmented) (-/5)					5				5				5				5				4				4
Connectedness (fragmented) (-/5)					5				5				5				5				4				4
Species mobility capacity (-/25)					25				25				25				25				17.5				17.5
Threats to the species (-/25)					25				25				25				25				12				12
Site context score (-/70)					**65.0**				**65.0**				**70.0**				**70.0**				**47.0**				**37.0**
Assessment unit totals																									
AU site condition score (-/3):																									1.75
AU site context score (-/3):																									2.54
AU species stocking rate (-/4):																									0.57
AU habitat quality score (-/10):																									**4.86**
AU area within offset area:																									586.3
Total offset area for this MNES:																									875.5
Area weighting:																									0.67
AU weighted HQS:																									**3.26**

Appendix B4: Offset assessment table – koala – future quality with offset

Assessment table for fauna habitat offset	**Assessment unit:**	**Bench-mark (BM)**	11.5.2 HVR	**BM**	11.5.2 HVR	**BM**	11.5.2a RV	**BM**	11.5.2a RV	**BM**	11.5.2 RV	**BM**	11.5.2 RV
	Property:		Colorado		Colorado		Colorado		Colorado		Colorado		Colorado
	Assessment site no:		HQP12		HQP13		HQP14		HQP16		HQP1		HQP3
	Regional ecosystem:	**11.5.2**	11.5.2	**11.5.2**	11.5.2	**11.5.2a**	11.5.2a	**11.5.2a**	11.5.2a	**11.5.2**	11.5.2	**11.5.2**	11.5.2

Ecological condition indicator		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**
Recruitment of woody perennial species (%)	**100**	100	100%	5	**100**	80	80%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees	**5**	3	60%	5	**5**	5	100%	5	**3**	4	133%	5	**3**	5	167%	5	**5**	4	80%	5	**5**	6	120%	5
Shrubs	**10**	6	60%	2.5	**10**	6	60%	2.5	**7**	8	114%	5	**7**	10	143%	5	**10**	8	80%	2.5	**10**	6	60%	2.5
Grasses	**9**	11	122%	5	**9**	10	111%	5	**11**	12	109%	5	**11**	10	91%	5	**9**	8	89%	5	**9**	7	78%	5
Forbs	**14**	15	94%	5	**14**	7	44%	5	**14**	14	100%	5	**14**	15	107%	5	**14**	2	13%	3	**14**	7	44%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer	**18**	16.7	84%	5	**18**	15	75%	5	**10.5**	10	95%	5	**10.5**	11.4	109%	5	**18**	17	85%	5	**18**	16.4	82%	5
Tree sub-canopy height	**10**	10.3	114%	5	**10**	8.6	96%	3	**7**	5.6	80%	5	**7**	8.2	117%	5	**10**	0	0%	3	**10**	8.7	97%	5
Average score				5.0				4.0				5.0				5.0				4.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer	**25**	18.8	78%	5	**25**	46.9	195%	5	**35**	43.6	125%	5	**35**	16.8	48%	3	**25**	16.9	70%	5	**25**	27.1	113%	5
Tree sub-canopy cover	**10**	17.7	136%	5	**10**	10.8	83%	5	**15**	20.2	135%	5	**15**	15.6	104%	5	**10**	0	0%	0	**10**	34.6	266%	3
Average score				5.0				5.0				5.0				4.0				2.5				4.0
Shrub canopy cover (%):	**9**	12.9	184%	5	**9**	15.7	224%	3	**4**	2.2	55%	5	**4**	9.3	233%	3	**9**	3.5	50%	5	**9**	37	529%	3
Native perennial grass cover (%):	**41**	17	45%	1	**41**	22.4	59%	3	**5**	4.8	96%	5	**5**	6.6	132%	5	**41**	2.4	6%	3	**41**	9.2	24%	1
Organic litter (%):	**35**	24	96%	5	**35**	48.4	194%	5	**55**	40.4	73%	5	**55**	73	133%	5	**35**	65.6	262%	3	**35**	42	168%	5
Large trees/ha (euc./non-euc. combined)	**13**	3	21%	5	**13**	2	14%	5	**30**	25	83%	10	**30**	13	43%	5	**13**	9	64%	10	**13**	13	93%	10
Coarse woody debris (m/ha)	**263**	365	152%	5	**263**	285	119%	5	**600**	630	105%	5	**600**	520	87%	5	**263**	245	102%	5	**263**	185	77%	5
Non-native plant cover (%):	**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0	0%	10	**0**	0.014	1%	10	**0**	0.01	1%	10	**0**	0.01	1%	10
Quality/availability of food/foraging habitat (-/25)				12.5				12.5				12.5				12.5				17				17
Quality/availability of shelter (-/25)				17				17				20				20				20				20
Site condition score (-/130)				**90.5**				**92.0**				**107.5**				**99.5**				**100.0**				**102.5**
Size of patch (fragmented) (-/10)				10				10				10				10				10				10
Context (fragmented) (-/5)				4				4				4				4				4				4
Connectedness (fragmented) (-/5)				4				4				4				4				4				4
Species mobility capacity (-/25)				25				25				25				25				25				25
Threats to the species (-/25)				15				25				15				15				25				25
Site context score (-/70)				**58.0**				**68.0**				**58.0**				**58.0**				**68.0**				**68.0**
Assessment unit totals																								
AU site condition score (-/3):								2.42								2.73								
AU site context score (-/3):								2.70								2.49								
AU species stocking rate (-/4):								1.71								1.71								
AU habitat quality score (-/10):								**6.84**								**6.93**								
AU area within offset area:								207.6								81.5								
Total offset area for this MNES:								875.5								875.5								
Area weighting:								0.24								0.09								
AU weighted HQS:								**1.55**								**0.61**								

Assessment table for fauna habitat offset																								
	Assessment unit:	**Bench-mark (BM)**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV			**BM**	11.5.2 RV		
	Property:		Colorado				Colorado				Colorado				Colorado				Colorado				Colorado		
	Assessment site no:		HQP5				HQP6				HQP8				HQP11				HQP20				HQP17		
	Regional ecosystem:	**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2			**11.5.2**	11.5.2		
Ecological condition indicator			**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**		**Value**	**% BM**	**Score**

Recruitment of woody perennial species (%)	**100**	100	100%	5	**100**	100	100%	5	**100**	100	100%	5	**100**	50	50%	5	**100**	100	100%	5	**100**	100	100%	5
Native plant species richness (No.): Trees	**5**	7	140%	5	**5**	5	100%	5	**5**	2	40%	5	**5**	7	140%	5	**5**	4	80%	2.5	**5**	3	60%	2.5
Shrubs	**10**	9	90%	5	**10**	12	120%	5	**10**	3	30%	5	**10**	8	80%	2.5	**10**	8	80%	2.5	**10**	3	30%	2.5
Grasses	**9**	7	78%	5	**9**	12	133%	5	**9**	13	144%	5	**9**	13	144%	5	**9**	12	133%	5	**9**	12	133%	5
Forbs	**14**	7	44%	5	**14**	16	100%	5	**14**	10	63%	5	**14**	7	44%	5	**14**	8	50%	2.5	**14**	19	119%	5
Tree canopy height (m): average of emergent, canopy and sub-canopy layer	**18**	13.6	68%	3	**18**	14	70%	5	**18**	15	75%	5	**18**	14.1	71%	5	**18**	14.5	73%	5	**18**	15.8	79%	5
Tree sub-canopy height	**10**	6.8	76%	5	**10**	6.4	71%	5	**10**	7.7	86%	5	**10**	7.5	83%	5	**10**	9.7	108%	5	**10**	9	100%	5
Average score				4.0				5.0				5.0				5.0				5.0				5.0
Tree canopy cover (%): average of emergent, canopy and sub-canopy layer	**25**	26.9	112%	5	**25**	26.5	110%	5	**25**	11.8	49%	5	**25**	47.8	191%	5	**25**	23	96%	5	**25**	46.4	193%	5
Tree sub-canopy cover	**10**	31	238%	3	**10**	19.4	149%	5	**10**	28.5	219%	3	**10**	32.5	325%	3	**10**	24.6	189%	5	**10**	2.6	20%	2
Average score				4.0				5.0				4.0				4.0				5.0				3.5
Shrub canopy cover (%):	**9**	8.5	121%	5	**9**	17	243%	3	**9**	23.2	331%	3	**9**	8.6	123%	5	**9**	13.4	191%	5	**9**	3.3	47%	3
Native perennial grass cover (%):	**41**	4.6	12%	1	**41**	7	18%	3	**41**	13.6	36%	3	**41**	19.4	51%	3	**41**	6	16%	1	**41**	18.2	48%	1
Organic litter (%):	**35**	51.8	207%	3	**35**	46	184%	5	**35**	69.4	278%	3	**35**	9	36%	3	**35**	10.2	41%	3	**35**	58.4	234%	3
Large trees/ha (euc./non-euc. combined)	**13**	36	257%	15	**13**	18	129%	15	**13**	13	93%	10	**13**	16	114%	15	**13**	22	157%	15	**13**	1	7%	5
Coarse woody debris (m/ha)	**263**	642	268%	2	**263**	925	385%	2	**263**	275	115%	5	**263**	145	60%	5	**263**	580	242%	2	**263**	585	244%	2
Non-native plant cover (%):	**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0.048	5%	10	**0**	0.01	1%	10	**0**	0.01	1%	10	**0**	0.01	1%	10
Quality/availability of food/foraging habitat (-/25)				17				17				17				12.5				12.5				17
Quality/availability of shelter (-/25)				20				20				20				20				20				20
Site condition score (-/130)				**106.0**				**110.0**				**105.0**				**105.0**				**96.0**				**89.5**
Size of patch (fragmented) (-/10)				10				10				10				10				10				10
Context (fragmented) (-/5)				4				4				4				4				4				4
Connectedness (fragmented) (-/5)				4				4				4				4				4				4
Species mobility capacity (-/25)				25				25				25				25				25				25
Threats to the species (-/25)				25				25				25				25				15				15
Site context score (-/70)				**68.0**				**68.0**				**68.0**				**68.0**				**58.0**				**58.0**
Assessment unit totals																								
AU site condition score (-/3):																								2.35
AU site context score (-/3):																								2.81
AU species stocking rate (-/4):																								1.71
AU habitat quality score (-/10):																								**6.93**
AU area within offset area:																								586.3
Total offset area for this MNES:																								875.5
Area weighting:																								0.67
AU weighted HQS:																								**4.6**

Attachment 1: Terrestrial ecology reports

Attachment 1A: Impact site ecology report

Bluff Terrestrial Flora and Fauna Impact Assessment (October 2013) McCollum Environmental Management Services

Please see file supplied separately

Attachment 1B: Offset site ecology report

Bluff Coal Project – Carabella Resources: Baseline Offset Site Investigation Report (March 2019) Gaia Environmental Consulting

Please see file supplied separately