KARARA MINING LIMITED

KARARA IRON ORE PROJECT MINE LIFE EXTENSION | REVISED OFFSET STRATEGY

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DOCUMENT CONTROL

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

Signed:

Full Name:
Organisation: Karara Mining Ltd
Date: 31 March 2026

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ABBREVIATIONS AND ACRONYMS

Term	Description
AOO	Area of Occurrence
BC Act	Biodiversity Conservation Act
BCE	Bamford Consulting Ecologists
CMSR	Centre for Mine Site Restoration
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DE	Development Envelope
DF	Disturbance Footprint
EPA	Environmental Protection Authority
EP Act	Environmental Protection Act 1986
EPBC	Environmental Protection and Biodiversity Conservation
ERD	Environmental Review Document
HQS	Habitat Quality Score
IBRA	Interim Biogeographic Regionalisation for Australia
IUCN	International Union for the Conservation of Nature
KIOP	Karara Iron Ore Project
KML	Karara Mining Limited
LIC	Linear Infrastructure Corridor
MIOP	Mungada Iron Ore Project
MLE	Mine Life Extension
MNES	Matters of National Environmental Significance
MoU	Memorandum of Understanding
MS	Ministerial Statement
PEC	Priority Ecological Community
ROM	Run-of-mine
TEC	Threatened Ecological Community
TSF	Tailings Storage Facility
TSSC	Threatened Species Scientific Committee
WA	Western Australia
WRD	Waste Rock Dump
YSRC	Yamatji Southern Regional Corporation

1 INTRODUCTION

1.1 Proposal Background

Karara Mining Limited (KML) operates the Karara Iron Ore Project (KIOP) and Mungada Iron Ore Project (MIOP), both located 320 km north-northeast of Perth and 225 km east-southeast of Geraldton in the Midwest region of Western Australia (WA) (Figure 1-1).

KIOP was approved under Part IV of the *Environmental* Protection *Act 1986* (EP Act) Ministerial Statement (MS) 805 and the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (approval EPBC 2006/3017) in 2009. KIOP consists of the Karara open-cut magnetite pit, a processing plant to produce magnetite concentrate, a waste rock dump (WRD), tailings storage facility (TSF), rail loading facilities, accommodation facilities, airport, access roads and the linear infrastructure corridor (LIC) including raw water pipeline to a borefield near Mingenew. Construction at the KIOP commenced in 2010, with mining and processing commencing in 2012.

MIOP was approved under MS 806 in 2009 and consists of the Blue Hills North and Terapod open pits and WRDs and regional infrastructure, including access road to Morawa, Tilley Rail Siding, and powerline corridor from Karara to Koola metering station to connect to the South West Interconnected System. MIOP was referred to the Commonwealth for possible assessment under the EPBC Act in May 2006, but the administering agency determined that mining activities at Mungada did not constitute a 'controlled action'. Mining at MIOP commenced in 2011 and was completed in 2014.

KML is seeking approval for a significant amendment to KIOP to further develop the KIOP with a Mine Life Extension (MLE), whilst incorporating aspects of MIOP required for the continued operations at KIOP (Figure 1-3). The Mine Life Extension Proposal was referred to the Environmental Protection Authority (EPA) under Section 38 of the *Environmental Protection Act 1986* (EP Act). The EPA Chair determined that the Proposal should be assessed at the level of Referral Information with additional information (required under s. 40(2)(a) of the EP Act) and four-week public review of the additional assessment information. The EPA issued a section 40(2)(a) notice with the information required for assessment.

KML also referred the significant amendment under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cth). The referral decision (EPBC No. 2023/09566) stated that the proposed action is a controlled action for listed threatened species and communities (section 18 and 18A of the EPBC Act) to be assessed by accredited assessment under the EP Act. The Department of Climate Change, Energy, the Environment and Water (DCCEEW) provided comments on adequacy of referral information and further information required for assessment.

The key attributes of the MLE Proposal comprise:

- Removal of the unconstructed western section of the raw water pipeline to the Mingenew Borefield originally approved under MS 805;
- Incorporating MIOP footprint approved under MS 806 to support mining activities at KIOP;
- Incorporating the areas required for maintenance of the linear infrastructure previously approved under Part V of the EP Act (clearing permits) to simplify the ongoing compliance management;
- Increasing the footprint of the WRD at KIOP to allow additional storage;
- Extending the TSF footprint at KIOP to the south and east;
- Increasing the mine pit envelope at KIOP to allow sufficient area for a revised abandonment bund and associated supporting activities; and
- Amending the KIOP development envelope to incorporate the above changes.

A draft Environmental Review Document (ERD) was submitted to the WA EPA in September 2025 and, in response to the comments received from the EPA and DCCEEW, KML made further reductions to the Development Envelope and proposed disturbance footprint to mitigate impacts of the KIOP MLE. A minor amendment to the Proposal under s43A of the EP Act (minor amendment) was submitted to EPA in February 2026 for the mitigated disturbance footprint.

An updated ERD (Umwelt, 2026b) was prepared to present the impact assessment findings of the mitigated Proposal that was the subject of the s43A application.

1.2 KIOP MLE Proposal Description

The following descriptions used throughout the ERD and this document are outlined below:

Proposal or Combined Proposal mitigated development envelope (Combined Proposal mitigated DE)

This is the Combined DE for the significant amendment, which includes the existing DE for MS 805 and provides a DE for MS 806, reduced as per the s43A minor amendment. This boundary includes the KIOP MLE mitigated disturbance footprint (defined below) and has an area of 13,500 ha. The Combined Proposal DE spans a distance of approximately 123 km from east to west, and for the purpose of this assessment has been split into two broad areas, which are hereafter named:

- **Mine Area:** entirely within the Yalgoo IBRA region, encompassing the KIOP and MIOP mine sites
- **Wheatbelt Area:** linear corridors entirely within the Avon Wheatbelt IBRA region

Proposal or Combined Proposal mitigated disturbance footprint (Combined Proposal DF)

The Combined Proposal mitigated DF has a maximum disturbance area of 4,710 ha and includes the mitigated disturbance footprint for the KIOP MLE (1,186 ha) plus the previously approved extents under MS 805 (KIOP) and MS 806 (MIOP), subject to minor amendments to exclude areas that have not been developed and are no longer required, and those tenements no longer held by KML. The sum of these individual areas is not equal to the Combined Proposal mitigated DF area. This is due to the removal of overlapping areas between the MS 805 and MS 806 disturbance footprints, previously approved areas which are located outside the current development envelope, and several corrections to erroneous spatial data.

KIOP MLE Mitigated Proposal or KIOP MLE mitigated disturbance footprint

This is the mitigated disturbance footprint required for the KIOP MLE incorporating the minor amendment. The new disturbance area is 1,186 ha. The KIOP MLE mitigated disturbance footprint is entirely contained within the Combined Proposal mitigated DE and proposes disturbance only within the Mine Area. Elements of the Proposal Content Document relevant to offsets are summarised Table 1-1 below.

1.3 Purpose of this Document

This Revised Offset Strategy is provided to support assessment of the KIOP MLE mitigated proposal under Part IV of the EP Act and under the EPBC Act. This document has been developed to describe and explain the proposed offset approach, providing information on the affected ecological values, the proposed offset sites, and their suitability to address any potentially significant residual impacts to the significant ecological values which have been identified. This document will, in the first instance, serve to guide consultation with EPA, DCCEEW, DBCA and other stakeholders on the appropriate kinds and amount of compensatory measures required to deliver net environmental gain and how the measures should be implemented and monitored.

Table 1-1: KIOP MLE Proposal Content Document relevant to offsets

Proposal element	Location	Existing extent for approved proposals (MS805 & MS806)	Proposed MLE extent	Combined Proposal maximum extent
Physical elements				
Development envelope	Figure 1-1 and Figure	Not defined	New element	Up to 13,500 ha
Area of disturbance	Figure 1-1 and Figure 1-2	MS 805: 3,028 ha MS 806: 1,059 ha	1,186 ha new disturbance, of which 1,185 ha is native vegetation Removal of 568 ha of disturbance from MS 805 and MS 806	Up to 4,710 ha

Proposal element	Location	Existing extent for approved proposals (MS805 & MS806)	Proposed MLE extent	Combined Proposal maximum extent
Pit dimensions	Figure 1-3	• Karara: Approx. 3,400 m long, 1,300 m wide, 300 m deep • Blue Hills North: 1,390 m long, 360 m wide, 133 m deep • Terapod: 1,440m long, 360 m wide, 140 m deep	No change	• Karara: max 3,400 m long, max 1,300 m wide, average 300 m deep below natural ground level • Blue Hills North: 1,390 m long, 360 m wide, 133 m deep • Terapod: 1,440 m long, 360 m wide, 140 m deep
Waste rock dump (WRD)	Figure 1-3	MS 805: 365 ha MS 806: 193 ha (includes ROM and WRD)	Additional 375 ha for KIOP	KIOP WRD: • 740 ha • Max height 450 mAHD (106 m above ground level). MIOP WRDs and ROM pads: • Blue Hills North: 135 ha • Terapod: 58 ha
Tailings storage facility (TSF)	Figure 1-3	Area not defined	Additional 261 ha for KIOP	KIOP TSF: • 865 ha • Max height 402 mAHD
Site infrastructure	Figure 1-3	• Processing plant • ROM pad • Bulk fuel storage and refuelling pads • Explosive compound and magazine • Wastewater treatment facility • Reverse osmosis plant • Landfill • Air strip • Borefields • Powerline • Rail siding • Site access	New infrastructure areas surrounding the WRD and TSF expansion areas at KIOP. New infrastructure area for the abandonment bund adjacent to the pit at KIOP. Incorporate infrastructure approved under MIOP to support ongoing operations at KIOP.	Combined infrastructure approximately 2,740 ha

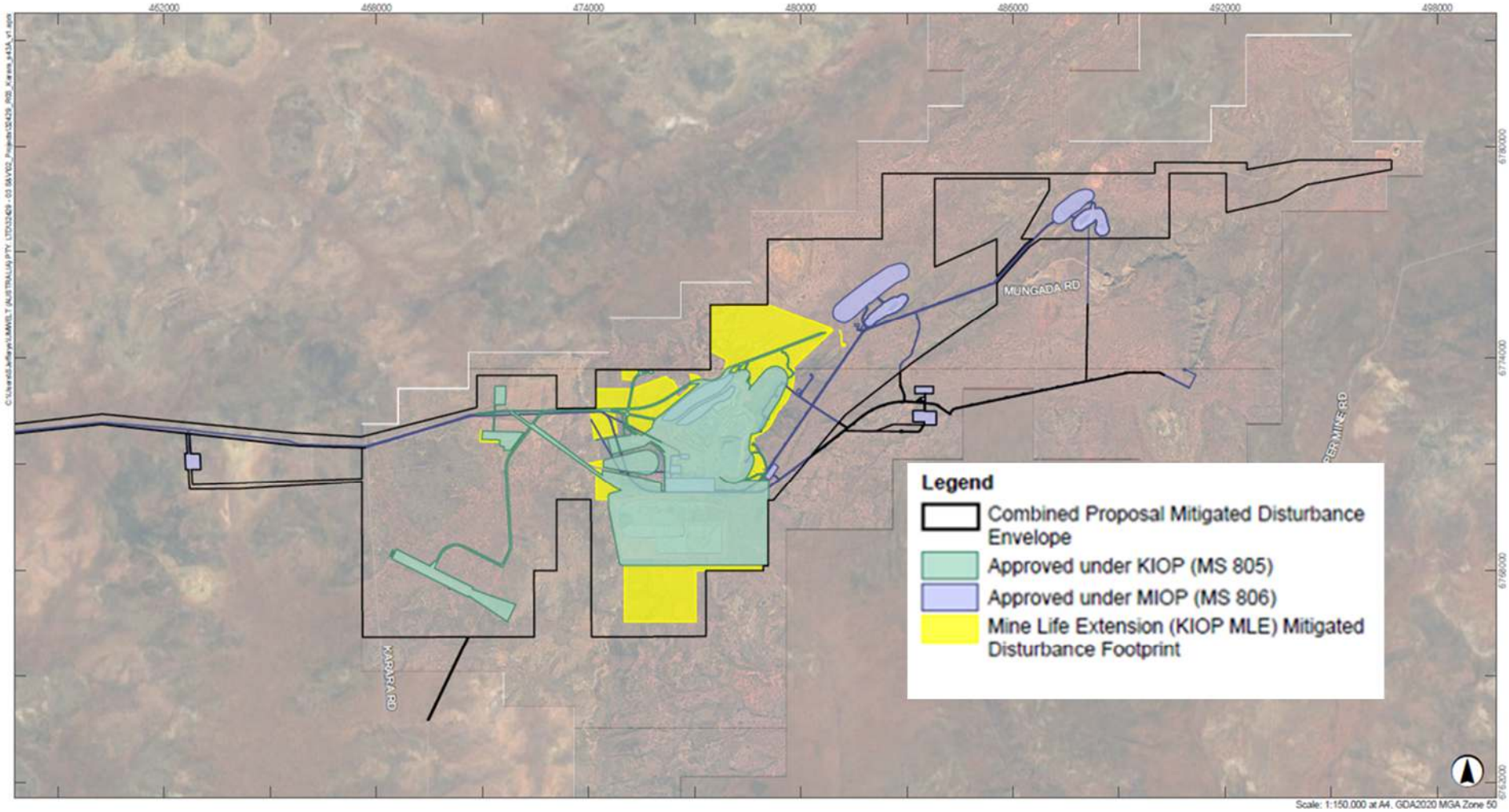

Figure 1-1: KIOP and MIOP Locations

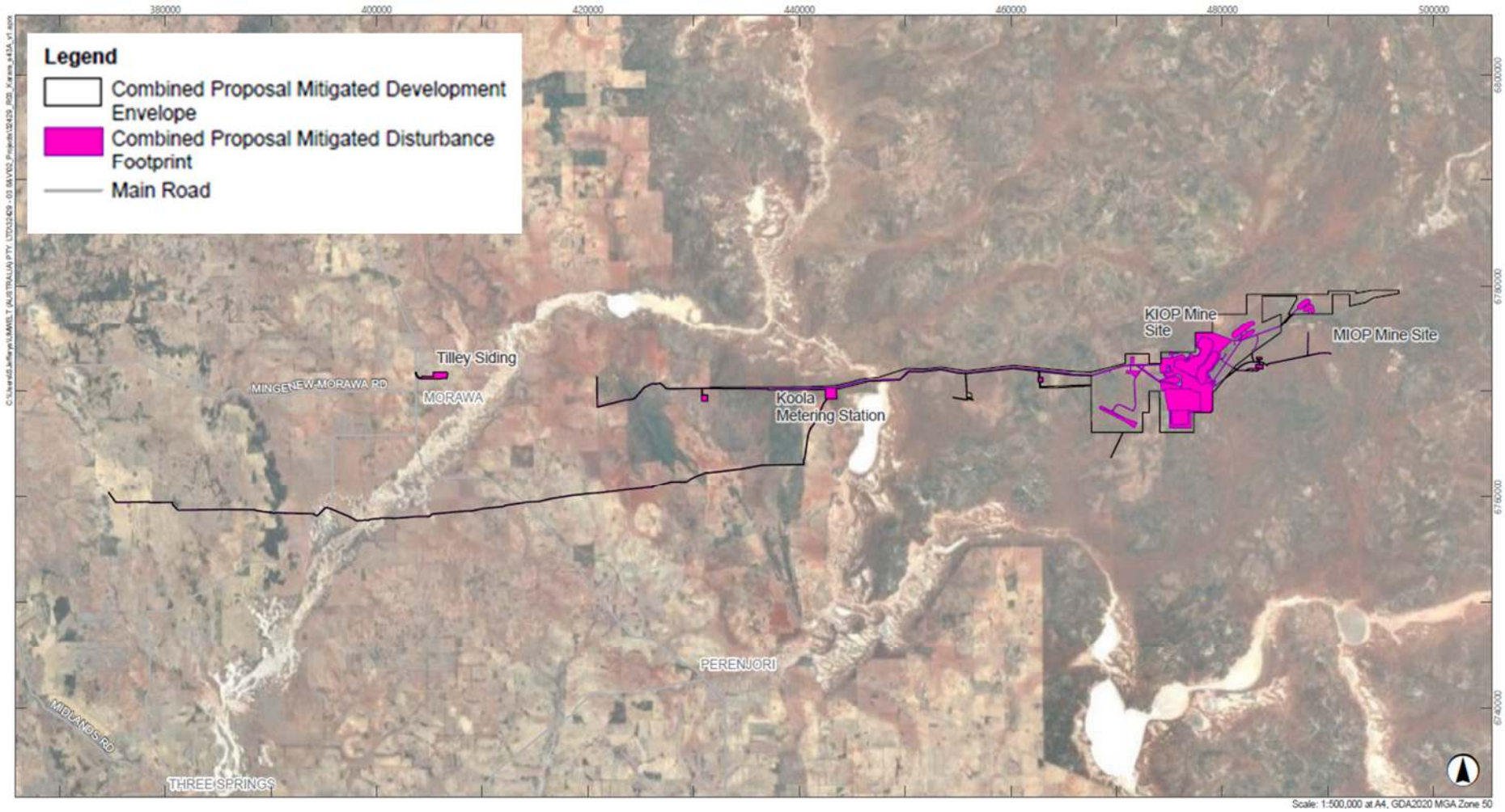

Figure 1-2: KIOP Mitigated footprint

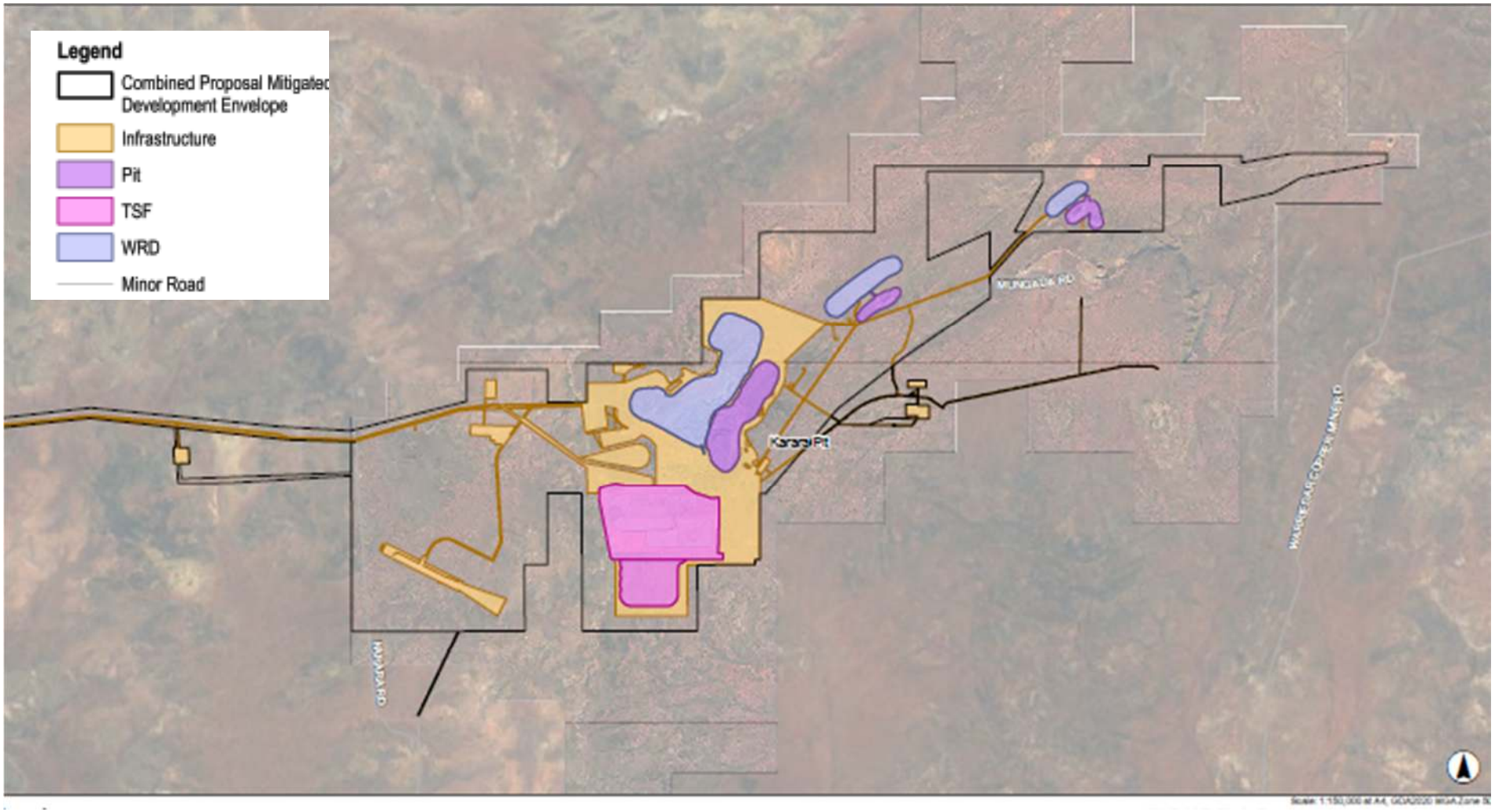

Figure 1-3: KIOP MLE Disturbance Footprint – Mine Area

1.4 Regulatory Context

1.4.1 Environmental Conditions

The Proposal has identified ecological values that are likely to experience residual significant impacts which will require appropriate compensatory measures. It is anticipated that approval conditions under the EP Act and EPBC for the KIOP MLE Proposal will require offsets to counterbalance residual significant impacts on Matters of National Environmental Significance (MNES) and other ecological values. This is likely to be achieved through the implementation of actions set out in an Offset Management Strategy (this document) and one or more Offset Management Plans to be developed prior to commencement of the proposed activities.

1.4.2 Environmental Offset Policy and Guidance

This document has been developed in accordance with the principles of the *WA Environmental Offsets Policy* (GoWA 2011) and the *WA Environmental Offsets Guidelines 2014* (GoWA 2014), whilst ensuring that the type and scale of the offsets proposed for MNES are appropriate and consistent with the principles of the *EPBC Act Environmental Offsets Policy* (Australian Government 2012). Table 1-2 and Table 1-3 summarise how these principles have been considered in this document.

Table 1-2: Offset Strategy Consistency with the Western Australian Environmental Offsets Policies and Requirements

Document	WA Offset Principles	Response
WA Environmental Offsets Policy (Government of Western Australia, 2011)	**Principle 1** Environmental offsets will only be considered after avoidance and mitigation options have been pursued	Avoidance and impact minimisation measures have been incorporated during the KIOP MLE planning stages. These will be ongoing throughout life of mine and details are included in the KIOP MLE Environmental Review Document (Umwelt, 2026). KML will continue to apply mitigation measures for the approved projects as required under implementation conditions for MS 805 and MS 806. An important consideration in the design of the Proposed Change was reducing the Disturbance Footprint of the Proposal from an initial 5,040 ha down by 330 ha to 4,710 ha. In terms of the overall Development Envelope, a reduction of 57 ha was made from the initial 13,557 ha to 13,500 ha. These design alterations have minimised, and in some instances, avoided, impacts on conservation significant flora species, conservation significant fauna habitat, significant watercourses and heritage sites in the vicinity of the Proposed Change.
	Principle 2 Environmental offsets are not appropriate for all projects	Residual significant impacts (RSI) have been identified from the Proposed Change, and as such the application of an offset is considered appropriate. An offset will be implemented as the significant residual impacts are not considered too minor to require an offset or likely to be considered environmentally unacceptable.
	Principle 3 Environmental offsets will be cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted	**Cost-effective:** KML has a commercial imperative to ensure that offsets are delivered cost-effectively and has considered potential alternative options accordingly. **Relevant:** Proposed offset sites will apply to each RSI and aim to protect, conserve or enhance that biodiversity value. **Proportionate:** Offsets have been developed per the WA environmental offsets metric (calculator and guideline) for each significant residual impact.
	Principle 4 Environmental offsets will be based on sound environmental information and knowledge	This offset strategy was developed based on information available to date and outlines further information to be collected to inform detailed offsets planning and implementation. Appropriately trained personnel will undertake all revegetation and threat abatement works using locally proven scientific methodologies. The threat abatement actions will be based on the most up-to-date information and scientific research.
	Principle 5 Environmental offsets will be applied within a framework of adaptive management	KML understands that an adaptive management framework should be applied to environmental offsets to account for the potential risks and uncertainties. The environmental offsets metric used in the development of this strategy accounts for risks associated with the proposed offsets, including uncertainty of outcomes and time-lag to achieve ecological benefits. Section 4.3 of this document outlines adaptive management processes and relevant contingency measures.

Document	WA Offset Principles	Response
	Principle 6 Environmental offsets will be focused on longer term strategic outcomes	Offset areas that consolidate linkages or provide buffers around remnant vegetation patches will be prioritised where possible to improve future connectivity and resilience of existing vegetation. The regional significance of the potential offset sites to provide strategic outcomes for ecological values is discussed in Section 3.
WA Environmental Offsets Guidelines (Government of Western Australia, 2014)	The residual impact significance model should be applied to determine whether significant residual impacts are likely to require offsets.	The RSI model was applied in both the *Flora and Vegetation Impact Assessment* (Umwelt, 2025a) and the *Terrestrial Fauna Impact Assessment* report (Umwelt, 2025b).
	Land acquisition offsets involve protection of values through improved security of tenure or restricting use of the land, such as ceding freehold land to the Crown or perpetual conservation covenants. This type of offset must consider the upfront costs of establishing the offset site and ongoing management. Land acquisition could be for an agreed site or contribution to a fund.	A land acquisition offset could be feasible for freehold land held by KML (e.g. Innovation Park), if it is suitable for restoration to improve or establish habitat for relevant ecological values.
	On-ground management offsets include revegetation, rehabilitation of ecosystem processes and actions such as management of weeds, feral animals or other threats. The objective is tangible improvement to ecological values.	The offsets for this project are primarily aligned to revegetation works on freehold land held by KML and combatting threatening processes on tenure held by KML (within exclusion zones) and within the freehold land. The areas nominated as offset sites have also been preferred due to the ecological communities within and adjacent to the areas. The exclusion zones have been identified as they form part of the Blue Hills Priority Ecological Community (PEC); it is widely documented that the PEC incorporates species of conservation significance. The freehold land sits within the boundary (and incorporated the lower slopes that historically are cleared) of the Koolanooka Hills Threatened Ecological Community (TEC). Both of these areas are considered of value for the purposes of land management.
	Research projects are possible offsets under Part IV of the EP Act, although they are generally only appropriate where there is a high degree of uncertainty regarding impacts and new science is required to develop better mitigation measures or ability to predict and minimise future impacts. Trials, research and monitoring for mine closure rehabilitation is generally not an offset. Research offsets must be designed to result in positive conservation outcomes, such as improving management of conservation estate,	Research project offsets could be feasible and appropriate for: • Trapdoor spider populations known to occur within the MLE, being: - Northern Shield-backed Trapdoor Spider (*Idiosoma clypeatum);* - Aganippe (*Idiosoma* sp.) spider (targeted survey to gather more information about potential distribution and habitat); and - Ornate trapdoor spider (*Idiosoma formosum*) • Other fauna species: Karara Millipede (short range endemic). • Flora species: - *Caesia* sp. Koolanooka Hills (R. Meissner & Y. Caruso 78) - Persoonia pentasticha - *Crassula* sp. nov

Document	WA Offset Principles	Response
	addressing priority knowledge gaps, and improving environmental assessment of future projects. Research projects should focus on achieving an outcome, rather than expending a certain amount of money.	
	Descriptive information about quantification of offsets.	Proposed direct offsets (land restoration and/or on-ground management to combat threatening processes) are quantified using the WA environmental offsets metric and/or the EPBC offset calculator (Appendix 2).
Environmental offsets metric: Quantifying environmental offsets in Western Australia (Government of Western Australia, 2021)	The WA environmental offsets calculator applies to all land-based offsets under the EP Act and bilateral assessments but does not apply for research offsets (relevant only under Part IV of the EP Act).	The WA environmental offsets calculator was used to calculate required areas for land acquisition and on-ground management offsets, except for compensatory measures to address potentially significant impacts on Matters of National Environmental Significance. Because DCCEEW does not recognise rehabilitation offsets, MNES offset calculations were done using the EPBC offset calculator. Refer Appendix 2.
	In developing a research offset, the proponent must set out the components of the research, description of how it relates to the impact, and cost estimate to deliver the outcome.	The required details for research offsets will be provided after preliminary discussion with regulators and researchers regarding potential research offsets as part of the development of an Offset (Research) Management Plan.
	Appendix C Rationale for scores used must be submitted as part of an offsets proposal.	The “rationale for scores used” table is provided per ecological value in Appendix 1. Information to support the rationale is included in Sections 0.
	Significant impact area or number of features should be the significant residual impact to the conservation significant ecological value.	The residual significant impact to the conservation significant ecological values identified is the direct impact (area within the KIOP MLE disturbance footprint excluding areas currently cleared or approved to be cleared).
	Habitat Quality Score must consider vegetation condition, site context and habitat value with additional information provided in Appendix A of the guideline.	Habitat quality score per ecological value considered site condition, site context and species stocking rate, including the aspects detailed in Appendix A of the guideline. Habitat quality score methods per ecological value are provided in Appendix 1.
	A rehabilitation credit can be included in the calculation when it is undertaken in accordance with a Ministerial Statement of approval under the *Mining Act 1978*, where the rehabilitation is of sufficient quality to return biodiversity values to the site.	Rehabilitation will be undertaken in accordance with the Karara Iron Ore Project Mine Closure Plan and completion criteria defined in Ministerial Statement 805. Section 3.3 provides information about evaluation of completed rehabilitation for suitability in returning biodiversity values. Rehabilitation credits are included for species not listed under the EPBC Act.
	A land acquisition offset that is proposed to be transferred to conservation management must be discussed with the proposed responsible vesting and management bodies to ensure the site is acceptable for transfer. Proposed land acquisitions should also include adequate funding for on-ground management.	A land acquisition offset could be feasible for freehold land held by KML (e.g. Innovation Park), if it is suitable for restoration to improve or establish habitat for relevant ecological values.

Document	WA Offset Principles	Response
	Where a combination of land acquisition and on-ground management activities are proposed for one site, separate calculations should be prepared for each type of offset. Where on-ground management varies across a site, separate calculations may also be needed.	Separate calculations are used where required for differences in offset approach per ecological values.
	The "future quality with offset" score for rehabilitation must be consistent with completion criteria for rehabilitation, where available.	The "future quality with offset" score for vegetation condition is consistent with future quality for rehabilitation areas, or the current quality of the offset site where this is higher (i.e. in better condition than future rehabilitation areas).
	Time until ecological benefit is the time between the impact and when the ecological benefit of the offset will be realised and must consider any delay in commencement of offset activities	The time until ecological benefit considers the ecological information in Section 0 and the offset site information in Section 3.4.
	Confidence in offset result (%) should consider the strength and effectiveness of proposed offset actions, and capacity of those actions to achieve stated outcomes.	Confidence in offset results considers the ecological information in Section 0 and the offset site information in Section 3.4.
	Duration of offset implementation is a maximum of 20 years.	The offset calculations use a maximum period of 20 years.

Table 1-3: Offset Strategy Consistency with the EPBC Act Offsets Policies and Requirements

Document	EPBC Offset Principles	Response
EPBC Act Environmental Offsets Policy (Australian Government, 2012)	Suitable offsets must deliver an overall conservation outcome that improves or maintains the viability of the aspect of the environment that is protected by national environment law and affected by the Proposed Action	Proposed offsets are expected to deliver conservation outcomes to the protected matters that will be impacted. A conservation gain will be achieved by establishing new habitat areas through enhanced restoration actions, implementation of landscape-wide management to reduce threatening processes and averting potential future loss by placing offset under conservation covenants in perpetuity. The offsets proposed are informed by the Malleefowl National Recovery Plan (DCCEEW 2024) and Western Spiny-tailed Skink National Recovery Plan (DEC 2012), and data collected through surveys and monitoring conducted by KML (as summarised in BCE, 2025).
	Suitable offsets must be built around direct offsets but may include other compensatory measures. A minimum of 90% of the offset requirements for any given impact must be met through direct offsets.	The proposed offset strategy includes providing offsets through enhanced restoration and threat abatement. Both are direct offsets predicted to achieve 90% direct offsets for significant impacts on EPBC Act ecological values.
	Other compensatory measures might include research or educational programs. They must meet the requirements outlined in Appendix A of the policy, including endeavour to improve the viability of the impacted protected matter, and be targeted toward key research identified by the Commonwealth for that ecological value.	Other compensatory measures proposed as part of the offsets for MNES align with the requirements of the policy, including targeting key research and improving viability of the protected matter.
	Securing existing habitat as an offset only provides conservation gain if that habitat was under threat of being destroyed or degraded. In these cases, the tenure for the offset should be legally secured for conservation (e.g. conservation covenants) for at least the duration of the impact and statutorily defined.	The offsets proposed that contain existing habitat are already within secure tenure or are in tenure that is not feasible to alter. No offsets are proposed that involve securing tenure for existing habitat that is under threat of removal (averted loss).
	Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter.	The EPBC Act offsets assessment guide was used to calculate the required offset to ensure it is in proportion to the conservation status of the protected matter. The proposed offsets reflect the conservation status of the species impacted, and the significance of the habitat impacted. Offsets have been developed using the Commonwealth offset calculator for each residual significant impact (Appendix 2).
	Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter	Direct offsets to compensate for at least 90% of estimated impacts on Malleefowl and Western Spiny-tailed Skinks have been estimated using the EPBC offset calculator. Top priority is assigned to actions to reduce known threatening factors, as such actions have a lower level of uncertainty and are likely to achieve observable benefits in a shorter time frame. Additional direct offset in the form of land restoration works on freehold land owned by KML are also proposed. Calculations and underlying assumptions are documented in Appendix 2.

Document	EPBC Offset Principles	Response
	Suitable offsets must effectively account for and manage the risks of the offset not succeeding	The uncertainty of offset success is included in calculating a suitable offset extent per the offset calculator. A plan for adaptive management and relevant contingency measures is included in Section 4.3.
	Suitable offsets must be additional to what is already required, determined by law or planning regulations or agreed to under other schemes or programs (this does not preclude the recognition of state or territory offsets that may be suitable as offsets under the EPBC Act for the same action)	For Matters of National Environmental Significance, KML has not included 'rehabilitation credits' in its offset calculations (notwithstanding that rehabilitation credits are available under WA offset policies). The offsets undertaken by KML will be in addition to the existing offset requirements of EPBC 2006/3017. Compensatory actions already completed under existing statutory approvals are summarised in Table 1.4 and Table 1.5.
	Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable. Offsets should be implemented before or at the same time as the impact. Offsets should be informed by desktop modelling of benefits and field work as required.	The offsets are proposed to be implemented at the same time as the impact. Offset benefits have been informed by desktop research and by KML's practical experience of land rehabilitation activities at KIOP and MIOP over the past 15 years. Qualified and experienced professionals will undertake all revegetation work using locally proven scientific methodologies to ensure they are efficient and scientifically robust. This document includes measures to ensure transparent (see Section 6 reporting and auditing provisions) and effective (see Section 4.3 adaptive management provisions) implementation of offsets.
	Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced. Offset proposals must include clear measures of success and benchmarks linked to the purpose of the offset. The proponent will be required to report data that allows for the performance of an offset to be evaluated.	Any condition regarding an offset strategy is expected to include governance arrangements, involving consultation with and endorsement at both state and federal levels and with Traditional Owners, as appropriate. The Offset Management Plan to be developed for each offset will include clear measures of success, benchmarks and monitoring to ensure offset performance can be evaluated. Offsets are documented in the publicly available Environmental Offsets Register.
	Where a proponent elects to use a third party for offset management, the proponent must make contractual arrangements to ensure the offset will be delivered in accordance with approval conditions. Third party providers might include rural landholders, private conservation organisations or indigenous groups.	Proposed parties for management of offset will be determined in consultation with stakeholders (including DBCA) and documented in the relevant Offset Management Plan. A list of engagements conducted to date is provided in Section 5.
EPBC Act Offsets Assessment Guide (DCCEEW, 2022)	Assessment of habitat quality for ecological communities and habitat must consider site condition, site context and species stocking rate. This should be informed by the ecological value habitat requirements,	The habitat requirements, lifecycle, movement and distribution patterns and threatening processes for the ecological values requiring offsets are described in Section 0 and informed the habitat quality score methods for each species, which are provided in Appendix 1. The completed EPBC Act offsets assessment guide for Malleefowl and Western Spiny-tailed Skink are provided in Appendix 2.

Document	EPBC Offset Principles	Response
	lifecycle, movement and distribution patters and threatening processes. These components should be weighted according to the ecological requirements of the impacted value	
	Confidence in result (%) for area offsets captures the level of certainty about successful changes in habitat quality and the strength and effectiveness of the proposed measures to avert loss of the site (where relevant).	The proposed offset management measures and confidence in result are discussed per offset site in Section 3.
	Where a direct offset does not meet 100% of the impact, the estimated cost of the offset is used to calculate a dollar value for the other compensatory measures required in the offset package. Strong evidence must be provided by the proponent to support the estimate of cost.	The estimated cost of the offset will be provided in an updated Offset Strategy following stakeholder feedback on the strategy (this document).
Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act (Report to National Environmental Science Programme, Department of the Environment and Energy, 2017)	Risk of Loss estimate is the likelihood that the proposed offset site will be lost completed due to anthropogenic impacts such as clearing. Risk of Loss estimate needs to be included in the calculation of direct offsets and should use the provided decision trees, which consider: • Does the proposed offset site contain the relevant ecological value? • Will tenure of the site change to secure protection? • Would any future development of the proposed offset site trigger an offset requirement?	Risk of Loss estimate is included in the calculation of all proposed direct offsets (Appendix 2).

1.4.3 Alignment to Approved Conservation Advice and National Recovery Plan

Where relevant, the habitat quality scoring criteria used in this document have been based on the information contained within the Approved Conservation Advice and National Recovery Plans listed below, supplemented by information gathered during field studies at the Proposal location (BCE 2025; Bradley et al., 2022):

- National Recovery Plan for Western Spiny-tailed Skink (DCCEEW 2021);
- National Recovery Plan for Malleefowl (DCCEEW 2024); and
- Approved Conservation Advice for *Idiosoma nigrum* (shield-backed spider) dated 26 April 2013.

1.5 Historical Report and Studies

KML has completed offset activities as part of previous commitments under KIOP approval conditions (EPBC 2006/3017)). Table 1-4 and Table 1-5 summarise offset actions completed by KML to date.

Table 1-4 Summary of Completed Offset Actions for EPBC Act

Item	KML Actions Completed	Status
Tenement relinquishment and conservation	The following exploration tenements were surrendered in 2014: E59/1138, E59/1496 to E59/1499 and E59/1500. KML completed rehabilitation of exploration activities on Mungada Ridge in 2020. Mining tenement M59/650 was surrendered by KML in August 2021 (DMPE Tengraph system records). M59/650 had an area of 995.95 ha.	Mungada Ridge was declared a National Park (Class A Reserve) in 2022, with an area of 1,000 ha, covering essentially the same area as relinquished tenement M59/650. KML had one quadrat in the national park for vegetation monitoring as an analogue site for rehabilitation (Quadrat Windaning), however it is no longer assessed since M59/650 was surrendered.
Research plan	KML was a founding research partner with the Centre for Mine Site Restoration (CMSR).	The CMSR undertook research including improved translocation management for Western Spiny-tailed Skink, restorage techniques for tailings facilities, and fauna utilisation of restored habitats. The findings of the CMSR have informed ecologically effective restoration at the dry-stack TSF. Five cover substrate media and a specific seeding plan were developed with the CMSR. These have been trialled at six sections of the northern wall of the dry-stack TSF since 2013. A mix of 200 mm BIF waste rock, 500 mm of rocky materials and 100 mm of topsoil has been identified as the most effective cover medium for rehabilitation of the dry-stack TSF.

Table 1-5 Summary of Completed Offset Actions for DBCA

Item	KML Actions Completed	Status
Surrounding mining interests over tenement M59/650	KML completed rehabilitation of exploration activities on Mungada Ridge in 2020. Mining tenement M59/650 was surrendered by KML in August 2021 (DMPE Tengraph system records). M59/650 had an area of 995.95 ha.	Mungada Ridge was declared a National Park (Class A Reserve) in 2022, with an area of 1,000 ha, covering essentially the same area as relinquished tenement M59/650. KML had one quadrat in the national park for vegetation monitoring as an analogue site for rehabilitation (Quadrat Windaning), and multiple control sites for monitoring the Northern Shield-backed Trapdoor Spider (*I. clypeatum*) however it is no longer assessed since M59/650 was surrendered.
Surrender mining interests over "Blue Hills West" tenement	The following exploration tenements were surrendered in 2014: E59/1138, E59/1496 to E59/1499 and E59/1500.	The area has been incorporated into the Blue Hills Conservation Area.
Botanical research	Works were undertaken with ecology of DRF and conservation significant species of the Blue Hills BIF ranges particularly: *Acacia woodmaniorum*, *A. karina* and *Lepidosperma* sp. Blue Hills.	Ongoing annual monitoring of *Acacia woodmaniorum* translocation in line with the Translocation Proposal – *Acacia woodmaniorum* (Fabaceae) CORP-EN-PLN-1007) endorsed by the DBCA.
Applied research	KML was a founding research partner with the CMSR.	The CMSR undertook research including improved translocation management for Western Spiny-tailed Skink, restorage techniques for tailings facilities, and fauna utilisation of restored habitats. The findings of the CMSR have informed ecologically effective restoration at the dry-stack TSF. Five cover substrate media and a specific seeding plan were developed with the CMSR. These have been trialled at six sections of the northern wall of the dry-stack TSF since 2013. A mix of 200 mm BIF waste rock, 500 mm of rocky materials and 100 mm of topsoil has been identified as the most effective cover medium for rehabilitation of the dry-stack TSF.
On ground works to combat threatening processes	No work specifically has been undertaken to address this action.	No works have been undertaken to date on this action.
Karara Block Strategy Management Plan	KML provided support and assistance with land management activities of the Karara Block.	KML worked collaboratively with the DBCA and completed some on-ground control actions (e.g. feral animal control) at the Karara Block (now the “Karara Conservation Park”) under the MoU for the Greater KIOP environmental offsets. This work discontinued in 2020/21. Karara Conservation Park is now managed by the DBCA.
Infrastructure	Some work was undertaken to support this under the MoU with DBCA; however, the works were minor. This included earthworks and management around the Warriedar homestead, roadworks and sign installation.	No further works have been undertaken since completion of minor items in 2012.
Caring for country	Training of Aboriginal monitors/rangers in rangeland assessment techniques	No works have been undertaken recently on this action.
BIF ranges surveys	A BIF ranges survey was completed in 2012 to support this work.	This work was completed in 2012.

For the MLE Proposal, studies have been undertaken to obtain an understanding of ecological values present within the modified footprint and development envelope and the potential for significant impacts arising from planned KIOP MLE activities. Habitat scores and proposed offset approaches are based on the environmental values, including the occurrence of habitat and species records, obtained from the following:

- 2023 and 2024 Detailed and Targeted Flora and Vegetation Assessment (Umwelt, 2025c);
- Fauna assessment of proposed disturbance areas, 2020 and 2024 (BCE, 2025); and
- KIOP MLE Landforms Assessment Technical Report (Umwelt, 2025d).

2 SUMMARY OF IDENTIFIED IMPACTS

This section identifies the ecological values that are expected to require offsets due to predicted significant residual impact.

For each ecological value, the significant residual impact is summarised with relevant ecological information that informed the habitat quality score (HQS) methods noted. An HQS method was developed for each ecological value in accordance with the *Environmental offsets metric: Quantifying environmental offsets in Western Australia* (Government of Western Australia, 2021) and *EPBC Act Offsets Assessment Guide* (DCCEEW, 2022). The HQS method for each ecological value is provided in Appendix 1.

2.1 Environmental Values

2.1.1 Flora, Vegetation and Ecological Communities

Flora and vegetation values in the regional area were characterised from results of detailed and targeted flora and vegetation surveys conducted in 2023 and 2024 by Umwelt (2025c), supplemented by information obtained from numerous flora and vegetation assessments that were completed within and in the vicinity of KIOP over the past 20 years. Impacts to these flora and vegetation values were originally presented in the *Flora and Vegetation Impact Assessment – Karara Iron Ore Project – Mine Life Extension September 2025* (Umwelt, 2025a)

Comments received from state and federal regulators on the KIOP ERD submitted in September 2025 recommended that further mitigations should be investigated to avoid and minimise impacts to ecological values. Further mitigations have therefore been applied under the KIOP MLE Mitigated Proposal, to avoid and minimise impacts to significant environmental values, including the Blue Hills Priority Ecological Community (PEC) and *Lepidosperma* sp. Blue Hills. Potential impacts to these values have been mitigated by removing the originally proposed disturbance areas that are no longer required from the KIOP MLE Mitigated Proposal and by reducing the disturbance footprint for new activities where possible.

The KIOP MLE Mitigated Proposal's potential for residual impacts to flora values was assessed in the *Karara Iron Ore Project Mine Life Extension – Review Significance of Residual Impacts* (Umwelt, 2026a) which included a review of survey adequacy and likelihood of occurrence assessment for significant flora previously considered likely or possible to occur in the mine area. Findings of the *Review Significance of Residual Impacts* (Umwelt, 2026a) concluded that implementation of the proposed MLE activities will not result in any significant residual impact to any of the MNES flora species or vegetation communities identified to be present within the Proposal area.

The significance of residual impacts for threatened or priority flora species that are not MNES and do not meet IUCN criteria for listing (*Calandrinia kalanniensis*, *Calandrinia* sp. Warriedar and *Millotia dimorpha*) considered the residual impact significance model in the *WA Environmental Offsets Guidelines* (GoWA, 2014). The assessment determined that impacts from implementation of the MLE Proposal would not trigger worsening of the conservation status for the identified species or increase the cumulative impact to a critical level (Umwelt,2026a). It was therefore concluded that there will not be a significant residual impact for any of the flora species identified and no offsets are warranted.

However, the implementation of the MLE Proposal has the potential to result in significant cumulative impacts to two Priority flora species and one undescribed species under the residual impact significance model in the *WA Environmental Offsets Guidelines* (GoWA, 2014), namely:

- *Caesia* sp. Koolanooka Hills (R. Meissner & Y. Caruso 78) (P1) (ephemeral and annual).
- *Persoonia pentasticha* (P3) (perennial).
- *Crassula sp nov.*

The Proposal is predicted to impact 172 *Caesia* sp. Koolanooka Hills (R. Meissner & Y. Caruso 78) individuals, representing a 63.9% decline in the total known number of locations of the species throughout its distribution, while 364 individuals of *P. pentasticha* will similarly be impacted, representing a 27.4% decline in the total known population of the species throughout its distribution.

The predicted impact to *Crassula* sp. nov. (undescribed species) of removing 2 out of 4 known locations is also potentially significant, although this 50% impact most likely reflects the small number of records of this undescribed species. Additional survey and research are required before a meaningful and effective direct offset can be proposed for *Caesia* sp. Koolanooka Hills, *Persoonia pentasticha* or Crassula sp. Nov. Practical trials aimed at propagating these locally significant flora will form part of the proposed land restoration program on freehold land held by KML. Additional details are provided in Section 3.4.

An assessment of the Proposal's potential residual impacts to the Blue Hills PEC was also undertaken (Umwelt, 2026a) and was applied to both the Blue Hills PEC boundary as applied in the regional impact assessment for Mungada East Expansion Project (Maia Environmental Consultancy, 2017) and the Blue Hills PEC boundary as mapped by DBCA (excluding 500m buffer). The assessment found that the Proposal's proposed disturbance, and the cumulative impact it will have to the Blue Hills PEC, will not increase the threat level for Blue Hills PEC (Umwelt, 2026).

2.1.2 Fauna and Habitats

2.1.2.1 Vertebrate fauna

Bamford Consulting Ecologists (BCE) conducted a targeted terrestrial fauna assessment covering an area that includes the Proposal and compiled existing data for a broader area, which includes the Combined Proposal mitigated DE (BCE, 2025) to inform impact assessments for the KIOP MLE proposal. Impact assessment results were originally presented in the *Terrestrial Fauna Impact Assessment – Karara Iron Ore Project – Mine Life Extension September 2025* (Umwelt, 2025b). An addendum of updated results was subsequently presented in *Environmental Values Updated Impact Assessment – Karara Iron Ore Project – Mine Life Extension February 2026* (Umwelt, 2026c). The addendum was produced to recalculate impacts within the mitigated Proposal areas, as well as to conduct more detailed analysis for Malleefowl, Western Spiny-tailed Skink and Trapdoor Spiders habitat values.

Findings of the *Review Significance of Residual Impacts* (Umwelt, 2026a) concluded that implementation of the MLE proposal has the potential to result in residual significant impacts for two MNES fauna species and two threatened species listed under the WA *Biodiversity Conservation Act 2016* (BC Act), but not under the EPBC Act, namely:

- Gilled Slender Blue-tongue (C*yclodomorphus branchialis*) - Vulnerable (BC)
- Ornate Trapdoor Spider (*Idiosoma formosum*) - Endangered (BC);
- Western Spiny-tailed Skink (*Egernia stokesii badia) - Endangered (EPBC); Vulnerable (BC)*; and
- Malleefowl (*Leipoa ocellata*) - Vulnerable (EPBC and BC).

2.1.2.2 Invertebrate fauna

An assessment was made for the two spider species against the *MNES – Significant impact guidelines 1.1 EPBC Act* (Department of the Environment, 2013) where it concluded that the residual impact to *I. clypeatum* is not significant[1]. While the assessment determined that there would be an impact on habitat critical to the species' survival (e.g. burrows and mapped suitable habitat) and reduction in its area of occupancy, it was determined that the species does not meet the criteria for listing as Vulnerable. The predicted impact to *I. clypeatum* would also not increase the threat level to the species such that it would trigger listing under IUCN criteria or increase the cumulative impact to a

[1] A spider initially identified as *Idiosoma nigrum* (Vulnerable under the EPBC Act) during surveys of the project area was included in a taxonomic review (Rix *et al* 2018) and was subsequently described as *Idiosoma clypeatum* (Priority 3). No spiders confirmed to be *I. nigrum* have been collected in the project area. At DCCEEW's request, project impacts on *I. clypeatum* or its habitat have been assessed *as if* the spiders belonged to an important population of the taxon *I. nigrum*.

critical level. It was therefore determined that the impact to the species is not significant according to the criteria for assessing significance of residual impact in the *WA Environmental Offsets Guidelines* (GoWA, 2014).

The same assessment, however, concluded that the residual impact to *I. formosum* is significant as the species meets the criteria for listing as Endangered, and the assessment determined that there would be an impact on habitat critical to the species' survival (e.g. burrows and mapped suitable habitat) which could lead to a decline in species abundance and distribution.

Two other short range invertebrate species – the Karara Millipede (*Antichiropus* sp. nov. 'Karara') and an unidentified trapdoor spider (*Aganippe* (*Idiosoma*) sp.) have been identified as 'locally significant'. The location at which the unidentified trapdoor spider was recorded will not be impacted by activities proposed for the MLE proposal. The potential distribution of this taxon is not known and its habitat requirements are also unknown. Accordingly, the significance of residual impacts on the species (if any) cannot be assessed. No direct impacts are proposed. Research funding and additional survey proposed by KML as part of its indirect offsets package may benefit this species.

No specimens of the Karara Millipede were recorded during baseline studies for the MLE Project. However, the species is thought to occur in the general project locality based on surveys conducted in 2006 (Umwelt, 2026a). The known range extends over a distance of approximately 17 km, and its preferred habitat appears to be ironstone hills. Some of the land that would be disturbed during implementation of the MLE Project may represent suitable habitat for the species, although no Karara Millipedes have been recorded in the proposed disturbance footprint. Given the rudimentary state of knowledge for this species, the most appropriate offset measure is additional survey and research to understand the distribution and ecology of the species.

2.2 Threatening Processes

2.2.1 Threats to Flora, Vegetation and Ecological Communities

Table 2-1 provides a summary of threatening processes for the conservation-significant flora and ecological community identified as likely to experience significant residual impacts from implementation of the MLE Proposal. Direct offsets are proposed to compensate for losses of the Blue Hills Priority Ecological Community and *Lepidosperma* sp. Blue Hills (A. Markey & S. Dillon 3468) (P1). In both cases, the direct offset will take the form of land restoration works on freehold land owned by KML. The restoration program aims to re-establish a corridor of native vegetation between intact vegetation at Koolanooka Hills and the Karara Rangeland Park conservation area. Additional details are provided in Section 3.4.

Table 2-1: Summary of Threatening Processes to Flora, Vegetation and Ecological Communities

Ecological Value	Threats
Lepidosperma sp. Blue Hills (A. Markey & S. Dillong 3468)	• Clearing and destruction of habitat (mining of BIF landforms); • Climate change leading to drought and contraction of available habitat; and • Weed competition.
Blue Hills PEC	• Clearing and destruction of habitat (mining of BIF landforms) • Weeds; • Livestock/ feral grazing; and • Inappropriate fire regimes.

2.2.2 Threats to Fauna

Table 2-2 provides a summary of threatening processes for each of the MNES and conservation-significant fauna species identified to be experiencing significant residual impacts from the Proposal.

Recovery plans are available for two of the fauna species that may be significantly impacted by implementation of the MLE Proposal.

Recommended on-ground management strategies in the National Recovery Plan for Malleefowl (DCCEEW, 2024) are to:

- Improve quality, connectivity and extent of habitat – including revegetate, control weeds, identify locations to establish or augment habitat corridors and patches;
- Manage fire – establish and implement fire management plans, including any special management for Malleefowl habitat;
- Manage impacts of herbivore grazing (stock and feral) – control rabbits, goats and camels, remove artificial water sources, fence habitat and exclude stock; and
- Manage impacts of introduced predators – control foxes and cats.

Recommended on-ground management strategies in the Western Spiny-tailed Skink National Recovery Plan (DEC, 2012) are to:

- Identify threating processes and mitigate threats;
- Manage known populations;
- Protect remnant habitat and create new habitat – trial artificial refugia;
- Develop conservation agreements with landholders and link remnant woodland patches; and

- Develop a strategy to translocate at-risk population when needed (noting that salvage translocation is not accepted as a direct offset by DCCEW).

Table 2-2: Summary of Threatening Processes to Fauna

Ecological Value	Threats
Malleefowl	Key threats to Malleefowl (as described by the Department of Environment and Conservation (2024)) include: • Clearing and habitat destruction; • Fragmentation and isolation of habitat; • Vehicle strike; • Fire, including planned burns and wildfire; • Impact of grazing (by feral and domestic herbivores); • Predation by feral foxes and cats; • Climate change, particularly declines in winter rainfall; and • Weeds (in the context of out-competing native vegetation).
Western Spiny-tailed Skink	Key threats to the species (as described by the Department of Environment and Conservation (2012) and Bamford (2025)) include: • Habitat clearing; • Factors that impact on tree recruitment (and subsequent logs) and presence of shrubs such as rising water tables and grazing; • Predators (feral cats and corvids); • Changes to natural processes (such as fire) that generate hollows and logs; and • Firewood collecting activities that removes logs and hollow trees.
Northern Shield-backed Spider and Ornate Trapdoor Spider and other (undescribed) trapdoor spiders	There is currently no published conservation advice or recovery plan for either species. Based on approved conservation advice for Shield-backed Trapdoor Spider (*Idiosoma nigrum*) dated 26 April 2013, the following threats were listed, which are likely to be similar to both trapdoor spider species under this Proposal: • Land clearing; • Habitat fragmentation; and • Grazing.
Gilled Slender Blue-tongue	Threats to the species include: • Habitat clearing and fragmentation of rocky ridge habitat; • Degradation of existing habitat due to rising water tables and salinity, grazing by rabbits, feral goats and domestic livestock; and • Predation.
Karara Millipede	Threats to short range endemic invertebrates, including the Karara Millipede, and may include: • Land clearing; • Grazing by feral and domestic animals; • Weeds; • Fire; and • Changed hydrology.

3 PROPOSED OFFSETS

Offsets are required to compensate for the possible residual significant impacts of implementing the MLE Proposal. Two types of direct offset are proposed:

- On-ground works to combat known threatening processes that threaten the viability of at-risk fauna and fauna habitats, and
- Land restoration works to improve habitat values, ecological connectivity and viability of priority or threatened species and communities.

3.1 Objectives

The objectives of this Offset Strategy are to:

- Identify compensatory measures to counterbalance the residual significant impacts to MNES and other ecological values arising from the implementation of the MLE Proposal;
- Propose actions to prevent future loss or degradation of environmental values within the enhanced restoration area;
- Appropriately address the threatening processes relevant to the MNES and ecological values requiring offset, through on-ground management within the enhanced restoration area and in exclusion areas excised from operational areas of the KIOP MLE mining tenements; and
- Undertake research projects on species where existing information is currently limited so as to enable effective conservation actions to be developed and implemented in future.

3.2 Quantification of Offset Obligations

Western Australian government policy recognises that offsets required under the EPBC Act may duplicate those required by State processes. Where values overlap, Western Australian government agencies will work cooperatively with the Commonwealth Government to align offsets and avoid duplication to the fullest extent practicable (GoWA 2014).

For significant residual impacts relating to MNES, KML has used the *EPBC Act Offset Assessment Guide* (DSEWPC 2012) to determine an offset proposal proportionate to the identified significant residual impact. For other ecological values, KML has used the *WA Environmental Offsets Policy* (GoWA 2011) and the *WA Environmental Offsets Guidelines 2014* (GoWA2014) instead.

3.3 Threatening Processes Management

3.3.1 Exclusion areas

Key threatening processes to the continued survival of the Malleefowl and Western Spiny-tailed Skink have been identified in their respective National Recovery Plans. Based on the current recovery plans and government conservation advice, the most important threatening factors affecting the species addressed in this offset strategy are further expanded in Table 3-1.

Table 3-1: Summary of threatening factors (MNES fauna and habitats)

Threatening Factor	Western Spiny-tailed Skink	Malleefowl
Loss or fragmentation of habitat due to infrastructure and/or mining development	The proposed KIOP MLE will directly impact mapped habitat values including active colonies, log piles and vegetation systems mapped as suitable potential habitat. Habitat clearing will reduce the availability of suitable habitat for the species and expand existing cleared areas but will not fragment patches of habitat. The impact areas are localised and do not serve as corridors between other suitable habitat for the species. Direct clearing of 239.1 ha of habitat is proposed within the Proposal development envelope.	There will be localised impacts to habitat suitable for nesting and foraging from the proposed KIOP MLE activities. While habitat fragmentation is a major threat across the species distribution, the KIOP MLE Proposal involves additional clearing adjacent to already impacted areas and will not cause additional fragmentation. Direct clearing of 931.7 ha of mapped suitable habitat is proposed within the project development envelope. Of these, 692.6 ha is mapped nesting habitat while the balance 239.1 ha is mapped foraging-only habitat.
Habitat degradation due to grazing by feral and domestic animals	Habitat degradation due to grazing animals is a known threat and occurrence of it have been observed within the KIOP MLE disturbance footprint. Potential colony sites were observed to provide little cover and food in the form of shrubs around the log pile, likely as a consequence of grazing by livestock. Grazing has resulted in vast areas of York Gum woodland with limited understorey, subsequently leading to low number of active colonies present.	Presence of herbivores not only reduces food sources for the Malleefowl, but also may cause long-term change to the vegetation composition and structure at the area due to supressed plant recruitment, compaction, changes in soil structure, and preferential browsing) Heavy grazing may also reduce the soil-stored seed of many perennial and ephemeral species, the diversity and abundance of invertebrates as a food source, with potentially serious implications to the quality of Malleefowl habitats.
Modification of natural processes	Research into the species has identified preferred habitat as hollow log piles with long logs, an average of three logs and overhanging mid-storey vegetation with low canopy cover (Bradley et al, 2022). The Western Spiny-tailed Skink National Recovery Plan states that discontinuation or modification of fire regimes that generate logs and regenerate woodlands is considered	Fire, whether wildfire or planned burning, is a major threat to Malleefowl populations. The National Recovery Plan for the Malleefowl stated that Mallefowl populations are likely to be greatly reduced where intentional broad-scale burning are advocated as pastoral management technique.

Threatening Factor	Western Spiny-tailed Skink	Malleefowl
	one of thethreats known to populations of this species in Western Australia.	
Predation	There has been an increase in predation due to greater abundance of feral animals and crows in the local area, particularly associated with the KIOP landfill (BCE, 2025). If unmitigated, this impact will likely continue during the implementation of the KIOP MLE Proposal.	Invasive predators such as foxes and cats are major predators and are already present in the KIOP MLE Proposal area. If unmitigated, this impact will likely continue during the implementation of the KIOP MLE Proposal.
Competition for food	The Western Spiny-tailed Skink National Recovery Plan did not specify competition for food as a key threat to the species, however as the species is largely herbivorous, competition with livestock and feral animals (e.g. rabbits) is possible.	Grazing and browsing by other herbivores denies Malleefowl food that may otherwise be available to them. Additionally, other grazers may also damage shrubs that are important as seed sources for the Malleefowl.

KML proposes to conduct on-ground management in mining exclusion areas to be established on parts of tenements G59/38 and E59/ 817-I (Figure 3-1). The on-ground management activities would serve to combat threatening processes in the designated 'exclusion areas' adjoining existing conservation land. The on-ground works are specifically aimed at reducing threats to Malleefowl, Western Spiny-tailed Skinks and Gilled Slender Blue-Tongue. At the project's completion, these exclusion areas could then be incorporated into the conservation estate by reservation under the *Land Administration Act 1997* and/or through the establishment of an Indigenous Protected Area or a private conservation reserve.

A 990.4 ha area located slightly northeast of the KIOP MLE mitigated disturbance footprint is proposed to be designated as Exclusion Areas for this Proposal (Figure 3-1). No mining activities would be carried out within the exclusion areas.

The Exclusion Areas will be managed to improve habitat conditions for certain species and communities known to occur in the locality, including – but possibly not limited to – Malleefowl, Western Spiny-tailed Skink and potentially the Gilled Slender Blue-tongue. On-ground management actions in exclusion areas are also likely to benefit locally significant invertebrate fauna, although the degree of benefit cannot yet be confidently predicted, given the limited knowledge of the ecology and distribution of the invertebrates.

Implementation of on ground works to combat threatening processes has been prioritised as a direct offset, as on-ground works (described in Section 3.3.2) have a high likelihood of delivering benefit, can be rapidly initiated and are cost-effective. However, the management of threatening processes

in proposed exclusion areas may not provide sufficient direct offsets to fully compensate some of the biodiversity impacts of implementing the MLE Proposal.

Table 3-2 presents a summary of KML's estimate of the benefits of implementing on-ground works in exclusion areas. The estimates of offset values shown in Table 3-2 were calculated using WA Environmental Offsets Policy (GoWA 2011) and the WA Environmental Offsets Guidelines 2014 (GoWA, 2014) for non-MNES species and EPBC offset guideline for MNES species (Malleefowl and Western Spiny-tailed Skink). Complete offset calculations are provided in Appendix 2.

Based on current calculations, it should be possible to fully offset project impacts on the Gilled Slender Blue-tongue and its habitat through on-ground actions to combat threatening processes.

Table 3-2: Estimated offset values (adjusted hectares)- management of exclusion areas

Ecological Values	**Malleefowl** Note 1	**Western Spiny-tailed Skink** Note 1	**Gilled Slender Blue-tongue**
Conservation status	Vulnerable (EPBC and BC Act)	Endangered (EPBC) Vulnerable (BC Act)	Vulnerable (BC Act)
Quantum of impact (ha)	692.6	239.1	115.39
Habitat quality in impact area	8	8	5.5
Quantum of impact (adjusted ha)	554.08	239.1	63.46
Area over which rehabilitation would be done (ha)	692.6	239.1	115.39
Habitat quality at completion of rehabilitation Note 2	NA	NA	5
Rehabilitation credit (adjusted ha)	NA Note 1	NA Note 1	19.40
Area over which on-ground management would be done (ha)	990.4	990.4	990.4
Duration of offset action (years)	20	20	20
Start habitat quality of offset area Note 3	8	8	5.5
Time to Benefit (years)	5	5	5
Future Habitat Quality without offset	7	7	5
Future Habitat Quality with offset	8	8	6
Confidence (%)	80	80	50Note 4
Offset value (adjusted ha)	88.90	83.01	59.77
Impact Offset (%)/ including Rehabilitation Credit where applicable	**16.04%**	**43.40%**	**135%**

Note 1: No rehabilitation credits are applicable for MNES species

Note 2: For non-MNES species, habitat quality in rehabilitated areas has been assigned a score equal to one-half unit lower than the pre-disturbance score.

Note 3: Start habitat quality in exclusion areas is assumed to be the same as that in disturbance areas.

Note 4: Confidence level has been reduced to reflect lack of certainty around ecological requirements and threatening factors applicable to the Gilled Slender Blue Tongue.

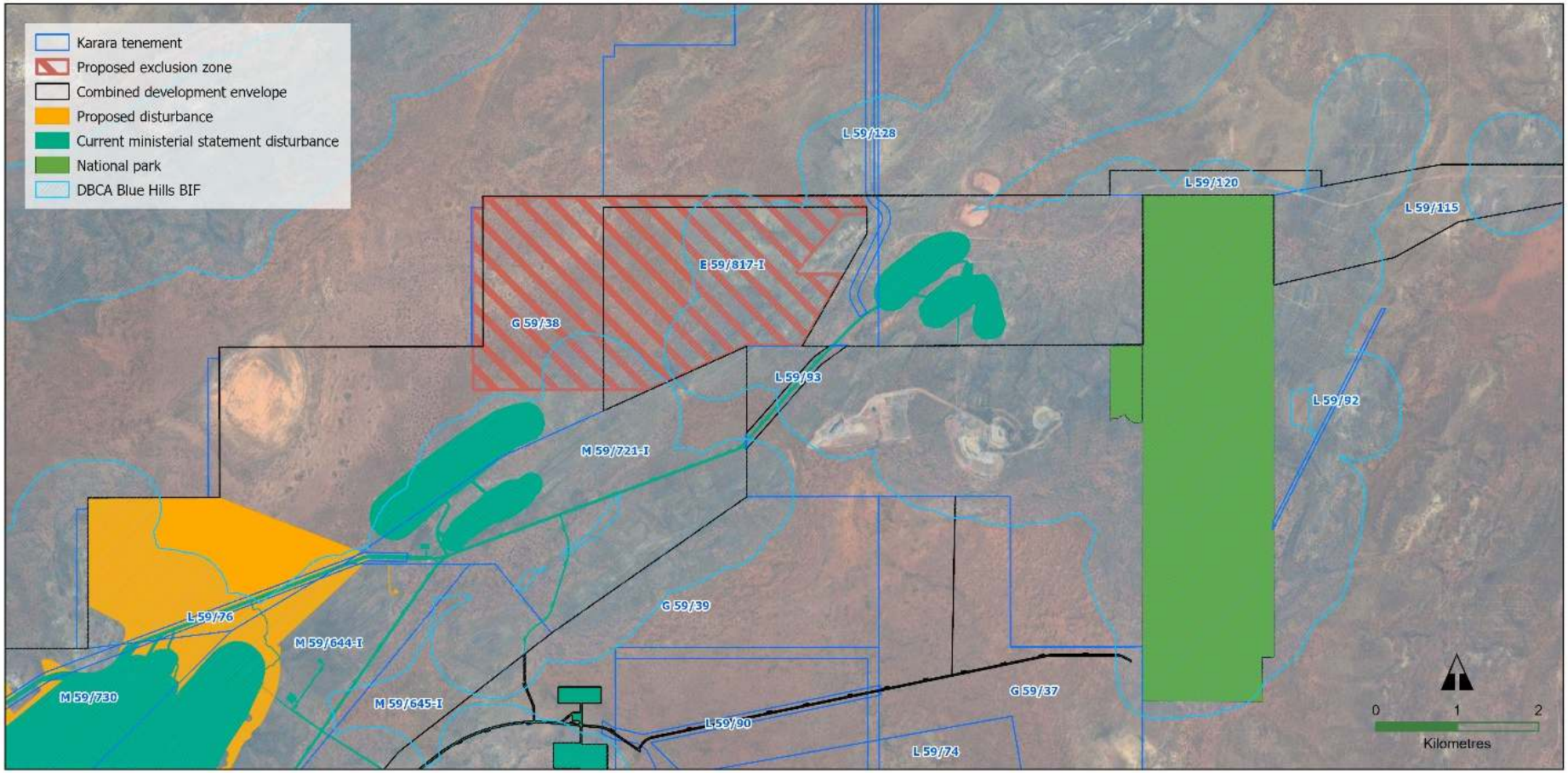

Figure 3-1: Exclusion zone areas

3.3.2 Actions to Address the Threatening Processes

The proposed Exclusion Areas will be managed to address threatening processes described in Table 3-1. KML proposes to implement threat abatement and management actions within the Exclusion Areas in addition to the actions implemented within the KIOP MLE development envelope. By implementing these actions at a broader scale, KML aims to achieve landscape-scale conservation management to supplement the restoration outcomes within the proposed Enhanced Restoration Areas (Section 3.4) and environmental management activities conducted by others within surrounding conservation estates. Specific actions will be developed to target the key threats to the relevant MNES and ecological values identified. Some of the threat abatement/ management actions proposed for implementation are outlined in the subsections below.

3.3.2.1 Weeds management

Weeds will be managed and monitored through a Weed and Plant Pathogen Management Plan, which includes the following:

- Provisions for preventing new weed species from entering the site and spread of weeds that are already present;
- Regular weed inspections will be conducted to ensure that there is no increase in the density and distribution of known weed species and that new weed species are not introduced;
- Identified populations of declared weeds to be controlled through manual weed spraying in accordance with site weed management procedures; and
- Signage to be installed to identify sensitive environmental areas (including exclusion areas) as “no go” areas.

3.3.2.2 Habitat degradation from grazing animals

Establishment of management measures such as installation of appropriate barriers to minimise opportunities for grazing animals to enter the Exclusion Areas, removal of artificial water sources, and active control of grazing feral animal populations.

3.3.2.3 Predation

Feral animal management and monitoring will be addressed through the implementation of KML’s Environmental Procedure – Feral Animal Management and Monitoring. Additional measures to be implemented at the proposed Exclusion Areas include:

- Management of crow abundance at landfill area; and

- Management of prey species (e.g. rabbits) to reduce potential predator animal incursions in tandem with management of predator species (e.g. foxes/ cats) to address changes to predator-prey relationships.

3.3.3 Resourcing threatening process management by others

In addition to the direct offset actions described above, KML proposes to offer a complementary offset contribution of $120,000/yr to be made to DBCA to allow management of threatening processes in adjoining conservation areas managed by DBCA. According to DBCA's most recent annual report (2024 – 2025) DBCA currently spends approximately $2.71/ha for land management activities aimed at conserving habitats, species and ecological communities (not including fire management). DBCA estimates the cost of controlled burning and other fire management activities at $15.89/ha. KML will continue to provide in-kind support for land management activities conducted by others. This includes, for example providing accommodation, water supplies and logistical support to organisations involved in bushfire prevention and management and controlling access to conservation areas.

3.4 Enhanced Restoration[2]

In addition to on-ground works in mining exclusion areas, KML proposes to undertake enhanced restoration activities at a parcel of agricultural land known as 'Innovation Park' and surrounding areas (Figure 3-2). Restoration of these areas will serve as a direct offset site to compensate unavoidable biodiversity impacts of the MLE Proposal.

The Innovation Park site is owned by KML as freehold land. The site is located approximately 45 km west of the KIOP MLE disturbance footprint at mine site and sits between the Karara Rangeland Park on the east and Koolanooka Hills TEC on its western boundary (Figure 3-3). The site lies within the Avon Wheatbelt IBRA. The land parcel proposed under this application has an area of approximately 1,000 ha available for use as a direct offset.

Innovation Park was last cropped in 2006. Soil is largely made up of weathered mantles and alluvium over granite rocks, with loamy hard setting topsoils and gravels, with some erosion. Vegetation includes *Acacia* and *Eucalyptus* with sparse understorey and remnant pasture. A site inspection of Innovation Park conducted in 2012 (Outback Ecology, 2012) categorised it into three land use zones:

- Ex-cropping, cleared of all native vegetation on low lying areas with gentle gradient;
- Disturbed areas impacted by borrow pits or excavations; and

[2] In this document the term 'enhanced restoration' is used to describe land rehabilitation and management practices that result in net environmental gains by creating and maintaining conditions that make ecosystems more viable, diverse, resilient and capable of withstanding or adapting to climate change.

- Isolated remnant native vegetation, with shallow soil profile, high coarse fraction, and steeper gradient (hills).

In 2012, total remnant native vegetation at the proposed restoration site was identified to cover 877 ha, including isolated remnant vegetation (Outback Ecology, 2012). KML has more recently estimated the extent of remnant native vegetation at the Innovation Park site (not including naturally bare areas, which may have been included in Outback Ecology's estimate) at 388.7 ha (Figure 3-4). These areas could be linked to form a larger continuous native vegetation areas.

Malleefowl mounds and Western Spiny-tailed Skink occur in the eastern portion of the Innovation Park site, as have been documented in KML monitoring data and Atlas of Living Australia records. More research is required to determine the presence of trapdoor spiders (*I. cypeatum* and *I. formosum*) within the Innovation Park site and adjacent areas, as well as obtain an understanding of the site represents potential habitat for either of the relevant spider species.

Innovation Park currently has a low ecological value, owing to its historical agricultural use, with Ecological Representativeness for most areas within the site falling below 50% (cleared land) as classified under the Environment Information Viewer (DCCEEW, 2026). The site demonstrates high potential biodiversity value at above 80% (DCCEEW, 2026). It has the potential to provide linkages with conservation areas that adjoin impact areas at the KIOP MLE Mine Area and shows good potential to provide suitable habitat for the Western Spiny-tailed Skink and Malleefowl. Suitable habitat for Spiny-tailed Skink involves presence of log piles, usually from York Gum but occasionally of other large trees such as *Melaleuca* spp, which provides a range of shelter sizes, from large hollows to narrow crevices. The habitat is most likely to support the species if the logs are located amongst shrubs such as *Eremophila* spp. For the Malleefowl, suitable habitat involves shrublands and woodlands dominated by mallee eucalypts with sandy soils and abundant leaf litter essential for constructing their nesting mounds. Malleefowl prefers long-unburnt vegetation with a diverse shrub understorey for food and shelter.

Undertaking enhanced restoration activities in this location will improve the integrity of areas surrounding the Karara Rangeland Park and increase connectivity within the wider landscape, especially with the Koolanooka Hills TEC.

Through enhanced restoration activities within Innovation Park and surrounding areas, KML intends to:

- Improve the quality of existing areas to meet habitat requirements of identified MNES and other ecological values of concern; and
- Re-establish areas of habitats to improve habitat connectivity within the wider landscape.

Proposed land restoration at Innovation Park is considered a longer term offset action than the proposed on-ground management of threatening factors in exclusion areas: while management of fire or reduction of feral predators may deliver benefits in as little as 5 years, the benefits from land restoration are expected to take decades.

The land restoration program at Innovation Park will be formally documented under an Offset Area (Land Restoration) Management Plan and will include establishment of a nursery to produce seeds and tubestock, planting of tubestock, weed management, management of feral herbivores and fire management in the Innovation Park offset area.

The EPBC offset calculator was used to estimate potential environmental benefits to MNES from land restoration. The DWER offset calculator was used to estimate benefits for other ecological values as listed under the BC Act. Table 3-3: Estimated offset values (adjusted hectares)- land restoration provides the minimum restoration area to achieve the 90% offset requirements (considered in combination with the direct offsets described in Section 3.3.1).

Preliminary calculations show that 90% direct offsetting – or better – can be achieved for all species except Malleefowl, for which offsets are required.

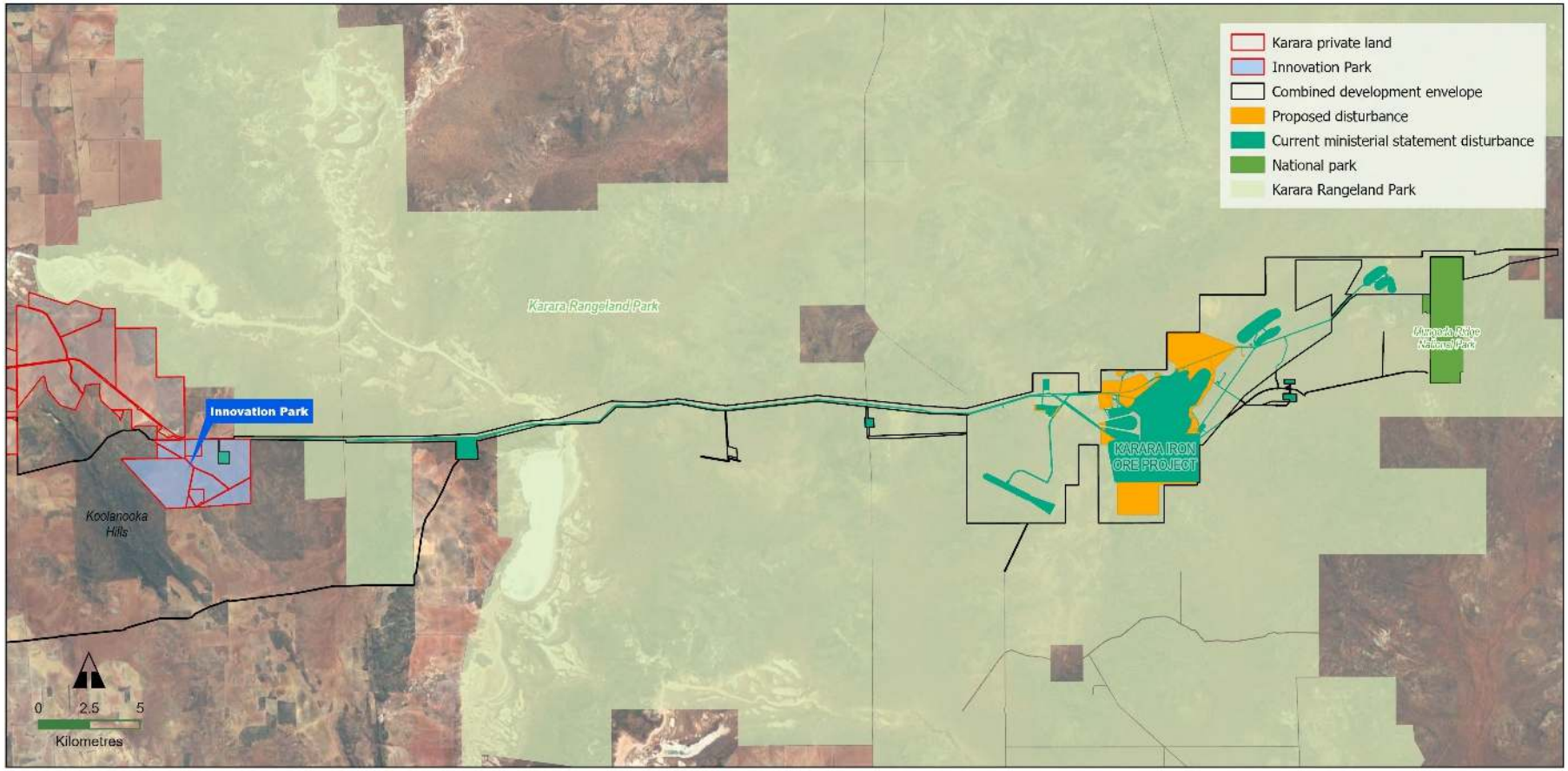

Figure 3-2: Location of Innovation Park and surrounding areas

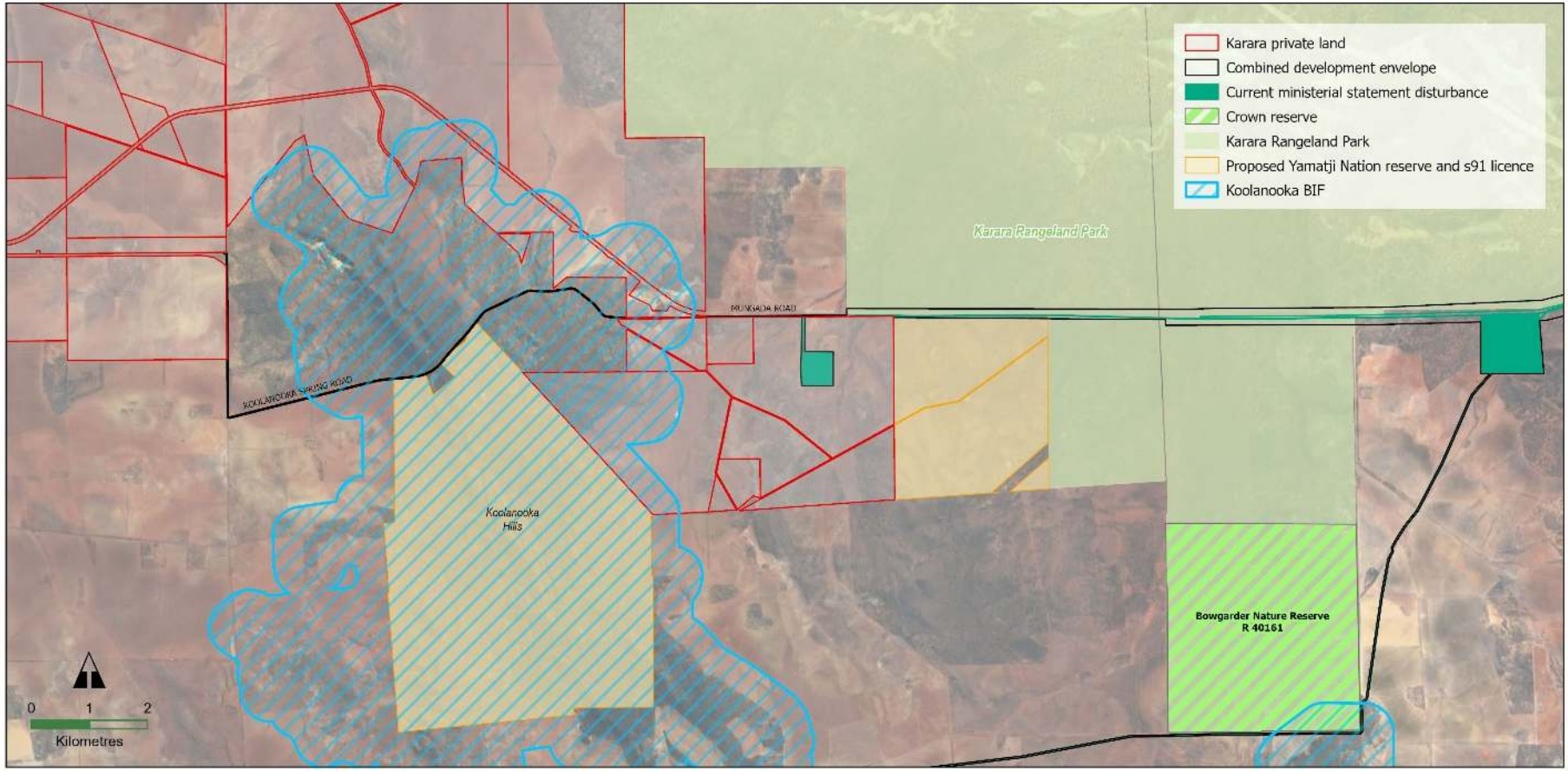

Figure 3-3: Location of Innovation Park in reference to Koolanooka Hills TEC and Karara Rangeland Park

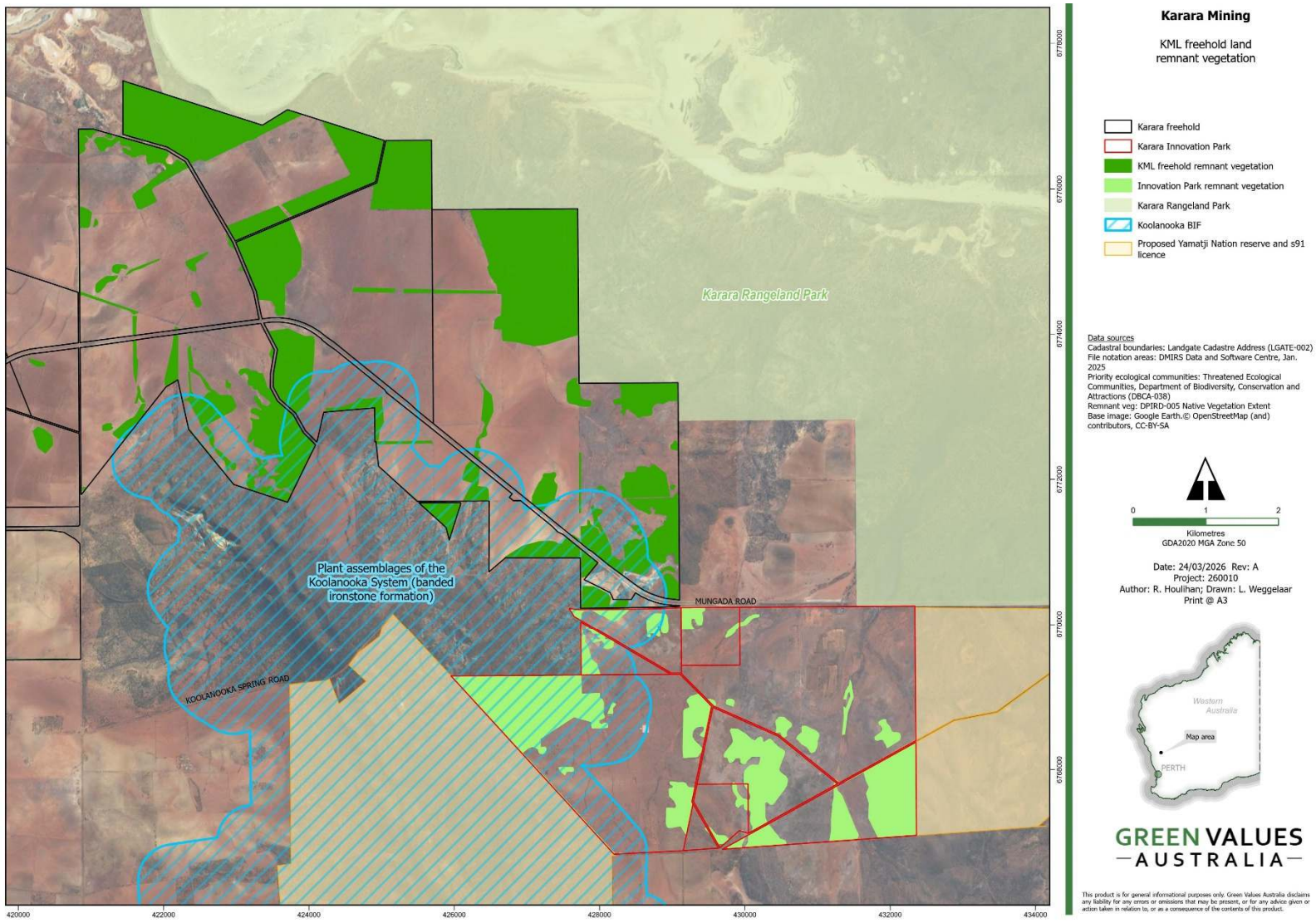

Figure 3-4: Estimated extent of remnant native vegetation on KML landholdings near Koolanooka Hills

Table 3-3: Estimated offset values (adjusted hectares)- land restoration

Ecological Values	Blue Hills PEC	*Lepidosperma* Blue Hills	Malleefowl	Western Spiny-tailed Skink	Gilled Slender Blue-tongue
Conservation status	Priority 1 (BC Act)	Priority 1 (BC Act)	Vulnerable (EPBC and BC Act)	Endangered (EPBC) Vulnerable (BC Act)	Vulnerable (BC Act)
Quantum of impact (ha)	98	*148*	692.6	239.1	115.39
Habitat quality in impact area Note 2	8.5	*6.5*	8	8	6
Quantum of impact (adjusted ha)	83.30	*96.20*	554.08	191.28	69.23
Minimum adjusted hectares required in addition to offsets listed in Table 3-2	83.30 Note 1	96.20 Note 1	409.77	108.27	No additional offset required
Duration of offset action (years)	20	20	20	20	
Start habitat quality of offset area	1.5	1.5	2	2	
Time to Benefit (years)	32	32	20	20	
Future Habitat Quality without offset	2.5	2.5	2	2	
Future Habitat Quality with offset	5	6	7	7	
Confidence (%)	70	70	70	70	
Minimum required extent of habitat restoration (ha) Note 2	495	405	1000	390	
Offset value of restoration offset (adjusted ha)	83.90	92.54	407.71	108.59	
Offset value (percentage of total offset required) Note 3	100.7%	99.9%	73.58%	56.77%	

Note 1: No rehabilitation credit has been assumed.

Note 2: Up to 1000 ha of land is available for restoration at Innovation Park. The areas in this row represent the minimum number of hectares that would need to be successfully restored to bring the total direct offset (considered in combination with on-ground works described in Table 3-2) to 90%.

Note 3: The percentages in this row refer to the percentage of the total amount of direct offsets that would be required to achieve 100% of required offsets.

3.5 Complementary offsets

3.5.1 Research and Monitoring

In some instances, there is insufficient information available about species in the project locality to propose a scientifically valid offset, or even to determine if an offset is warranted.

In this instance, KML proposes to support research activities to improve understanding of the species of concern. For this Proposal, research is proposed to improve understanding of the ecology and occurrence of the Shield-backed Trapdoor Spider (*I. clypeatum*) and the Ornate Trapdoor Spider (*I.* Formosa) involving:

The continuing of existing research work on *I. clypeatum* on the ridges in the KIOP MLE development envelope. The research involves monitoring spiders in control and impact sites with respect to the existing mine;

- Research to identify *I. formosum* habitats outside of the KIOP MLE development envelope. *I. formosum* has a more restricted distribution than *I. clypeatum*, occurring mainly on the clay-loam flats rather than along the ridges, within or very close to the KIOP MLE development envelope;
- Research to determine if there are spiders in native vegetation on either side of the Innovation Park Enhanced Restoration Area; and
- Targeted survey at granite areas to find more records of Aganippe (*Idiosoma* sp.).

Additionally, it is proposed to undertake a review of existing records to determine if there are any habitat patterns for the Gilled Slender Blue-tongue. A trial of trapping techniques will be conducted to further understand the species' habitat use to supplement existing data.

3.5.2 Indigenous Capacity Building

It is intended that Indigenous capability is built using the existing infrastructure at Innovation Park. Facilities at the Innovation Park site include an existing horticultural operation and shade-house operated by the Midwest Aboriginal Employment and Economic Development (MEEDAC) Incorporated The site facilities are suitable for support of plant propagation and revegetation activities.

KML has started engagement with Yamatji Southern Regional Corporation (YSRC) and MEEDAC to progress Aboriginal participation in the proposed direct offsets programs, including both the revegetation works, and the combatting of threatening processes. The overall intent is that capability is developed in the region that can support large-scale revegetation and rehabilitation works, which could be utilised outside of the works associated with the offset package.

4 MONITORING AND GOVERNANCE

4.1 Monitoring

It is estimated that the initial preparation and implementation of the enhanced restoration activities will take approximately five years. The following activities will be undertaken within this initial period:

- Design of the enhanced restoration program and consultation with stakeholders (6 months)
- Installation of infrastructure including fencing (8 months)
- Planting of pioneer species/ native shrubs (12 months)
- Seed collection (12 months)
- Seedling development (12 months)
- Initial revegetation works (12 months)

Monitoring will commence immediately upon commencement of the enhanced restoration works. An initial survey will be conducted at the enhanced restoration area and a designated control site to establish the baseline conditions in which future monitoring results will be compared against.

Annual assessments will be conducted during Spring for the initial three years of the enhanced restoration activity. Frequency of subsequent monitoring will then be reduced to once every two years, depending on the results of the annual assessments.

4.2 Success Criteria

The following success criteria must be achieved within 20 years of the commencement of activities within the enhanced restoration area for them to be deemed successful:

- The density and richness of native flora species within the enhanced restoration area are >70% of that within reference sites.
- Species composition within restored areas is similar to the species composition of relevant reference sites (within 10%).
- The vegetation condition within the enhanced restoration area is equal to or greater than the reference sites.
- No Weeds of National Significance, Declared Pests or species identified as posing a significant threat to relevant MNES are present within the enhanced restoration area.
- The percentage coverage of all other weeds is no greater than the reference sites.

- More than 50% of the native flora species within the enhanced restoration area are recorded as fruiting, flowering or seeding.
- 1,000 ha of vegetation within the enhanced restoration area is classified as suitable habitat for Malleefowl.
- At least 350 ha of vegetation within the enhanced restoration area is classified as suitable habitat for Western Spiny-tailed Skink.
- The abundance of feral fauna species within the enhanced restoration area is no greater than the reference sites.

4.3 Adaptive Management and Contingency

KML will adopt an adaptive management approach to enable effective allocation of resources and funding to address the most important threatening processes throughout the offset period. The adaptive management actions taken will be included in reports submitted to regulators to document performance and demonstrate compliance with environmental approvals.

If, following the implementation of enhanced restoration actions (Section 3.4), the monitoring results indicate the success criteria are unlikely to be achieved, contingency measures as presented in Table 4-1 will be implemented.

Table 4-1: Contingency Triggers and Actions

Triggers	Contingency Actions
Revegetation monitoring shows that the number and type of species are unlikely to meet success criteria	1. Investigate the root cause of revegetation decline/failure to establish. 2. Implement additional direct seeding or planting of seedlings to enhance species establishment. Install additional fauna refuge/habitat (i.e. rock or log piles) or improve the established fauna refuge/habitat. 3. Continue to undertake monitoring, using the methodology in Section 4, to determine the success of contingency measures.
Habitat conditions in restoration area fail to achieve target habitat condition scores used in offset calculations	1. Review land restoration practices 2. Investigate whether other KML private landholdings offer more suitable conditions for creating threatened fauna habitat.
New infestation of, or increased distribution, abundance or density of a significant weed species within the enhance restoration area.	3. Investigate the source of weed infestation. 4. Survey to review the extent of weeds within the enhanced restoration area. 5. Increase frequency and effort of weed control during control events. 6. Apply additional hygiene control throughout the offset area and education measures, if relevant.

Triggers	Contingency Actions
Increased abundance and/ or distribution of feral animals within enhanced restoration area.	1. Investigate the source of feral animals within enhanced restoration area. 2. Remove feral animals. 3. Repair any damaged fencing or gates. 4. Increase the frequency and effort of feral animal control measures during control events.
Unauthorised access to enhanced restoration area.	1. Immediately remove any unauthorised people from the enhanced restoration area. 2. Repair any damaged fencing, gates or signage. 3. Implement stronger deterrents for people accessing the enhanced restoration area – local roadblocks/gates.

5 STAKEHOLDER ENGAGEMENT PLAN

Engagements have been undertaken with stakeholders from the earliest stages of the KIOP MLE proposal and KML plans to continue to engage with relevant regulators, landholders, and community groups, as appropriate, throughout this process. Table 5-1 provides a summary of engagements relating to the KIOP MLE proposal, and this Offset Strategy specifically, that has been conducted with stakeholders to date.

Table 5-1: Summary of Engagements with Stakeholders

Date	Stakeholders	Description of Consultation
26 September 2023	Yamatji Southern Regional Corporation (YSRC)	• Introduction to the new YSRC stakeholders. • Briefing on the 2023 exploration drilling activities and the KIOP MLE proposal.
27 October 2023	DWER – EPA Services Commonwealth DCCEEW	• Clarification on the EPA and DCEEW's additional information requirements to continue assessment of the KIOP MLE proposal
5 December 2023	DWER – EPA Services Commonwealth DCCEEW	• DCCEEW's requirements on offset management for the KIOP MLE proposal
6 March 2024	YSRC	• Potential impacts on the Aboriginal Cultural Heritage Sites and requirements of additional Aboriginal Heritage surveys required for the Proposal
7 March 2024	DBCA Mid West	• Update DBCA on the KIOP MLE proposal and associated flora and fauna studies/ assessments as required by the EPA/ DCCEEW and timeframe of the EPA/ DCCEEW's assessment
11 September 2024	YSRC – Perth	• Brief and updates on the KIOP MLE proposal • Aboriginal Cultural Heritage surveys conducted for the original KIOP and the Proposal • Potential impacts on the Aboriginal Cultural Heritage Sites and requirements of additional Aboriginal Heritage surveys required for the Proposal • Access of the Karara Homestead
17 December 2024	DCCEEW and EPA	• Update on the progress of the studies/ assessments for the KIOP MLE Proposal. • Discussions on the proposed offset strategies in line with the DCCEW/ EPA's requirements. • Communication about the KML's proposed proposal assessment and approval timeline.
11 February 2025	YSRC – Geraldton	• Briefing on the current status of KIOP operations. • Updates on the progress of the KIOP MLE proposal. • Brief on KML's upcoming exploration in the area.
13 March 2025	DBCA Midwest Regional Office – Geraldton	• Discussion on the offsets strategy and potential cooperation with DBCA to conduct direct offset (e.g. on-ground management) for the KIOP MLE proposal.

Date	Stakeholders	Description of Consultation
1 May 2025	DCCEEW and EPA	• Updates on the studies/ assessment for the KIOP MLE proposal and the ERD submission.
24 July 2025	DCCEEW and EPA Services	• Offset strategy options proposed for the KIOP MLE proposal.
7 November 2025	DCCEEW and EPA Services	• Offset Strategy for the KIOP MLE Proposal. • Updates on the review of the ERD.
14 November 2025	DBCA	• Advice on the Offset Strategy for the KIOP MLE proposal.
19 January 2026 2 February 2026	DCCEEW and EPAS	• Proposed mitigated disturbance footprint and development envelope for the KIOP MLE proposal and updated ERD s43A application for the proposal.
11 March 2026	EPAS, DCCEEW, DBCA, Green Values Australia and Bamford Consulting Ecologists	• Proposed offset Strategy. • Regulators expectations on the Offset Strategy for the KIOP MLE. • Pathway forward with Offset Strategy submission.

6 REPORTING AND AUDITING

Throughout the life of the Proposal, KML will undertake external reporting to key regulatory agencies to demonstrate compliance with environmental approvals. Any potential non-compliance or significant findings will be documented and reported to the relevant agencies as required.

Annual Compliance Reports will be prepared to detail the result of the internal compliance and performance against the Proposal's approval conditions and the management commitments outlined within this document. The Annual Compliance Report will include a section that summarises the following:

- Progress of land restoration activities
- Description of activities to combat threatening processes completed in previous 12 months.
- Documentation of monitoring undertaken
- Comparison of monitoring results to trigger values
- Documentation of any contingency actions undertaken
- Performance of the environmental management plan(s) and program(s).

It is noted that the Offset Strategy will be regularly reviewed and, if necessary, revised over the offset implementation period, particularly in response to audit findings and monitoring results.

7 ROLES AND RESPONSIBILITIES

Accountability for implementing and reporting on the Offset Strategy rests with KML until completion criteria have been achieved and approval conditions met. The responsibility for the day-to-day implementation of the Offset Strategy will be delegated to the KML Environmental Superintendent.

The enhanced restoration will be implemented with the support of experienced contractors, including site preparation and direct seeding or supplementary planting. After establishment, KML may partner with local community groups to oversee the ongoing management and maintenance of the site.

8 REFERENCES

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APPENDIX 1. HABITAT QUALITY SCORING

The habitat scoring framework presented in this appendix is identical with the framework developed by Umwelt Australia Pty Limited and presented in Umwelt's *Karara LIife of Mine Expansion – Draft Offset Strategy* (V2, 7 November 20225).

Table A1 Malleefowl Habitat Quality Score Methods

Component	Weighting (%)	Scoring System
Site Condition	**75%**	Suitability of site weighted high as malleefowl have specific habitat requirements
What is the structure and condition of the vegetation on the site?		Scored on vegetation condition rating: 0: Completely degraded 0.2: Degraded 0.4: Good 0.6: Very Good 0.8: Excellent 1: Pristine
What relevant habitat features are on the site (for foraging, shelter, breeding)?		0: Site has no suitable habitat features 0.5: Approximately 50% of site has suitable habitat features. 1: Entire site has suitable habitat features. Malleefowl habitat: sandy substrate with abundant leaf litter and a high diversity and density shrub layer. Long unburnt (40+ years).
Site Context	**20%**	
What is the connectivity with other suitable/known habitat or remnants?		0: Site is effectively isolated 0.4: Site is continuous with extensive native vegetation but does not form part of an ecological corridor or important remnant or refuge 0.7: Site forms a medium to large area of remnant vegetation. 1: Site is part of an ecological corridor.
What is the species mobility/ dispersal capacity?		0: Species is highly mobile and expected to migrate to nearby suitable sites. 0.5: Species has some ability to migrate, possible suitable sites within range. 1: Species is highly restricted in mobility and unlikely to be able to migrate. Mallefowl range: Breeding Malleefowl have an average home range between 83 ha and 92 ha and are tightly bound to their nesting mounds. They have a typical range of 2 km, travelling primarily by foot.
What threats occur on or near site?		See Threats Sub-score Matrix (below). Malleefowl threats: clearing and habitat destruction, fragmentation and isolation, vehicle strike, fire, grazing and feral predators.
Species Stocking Rate	**5%**	Species stoking rate weighted low due to species mobility.

What is the presence of the species on the site? (i.e. confirmed/ modelled).		0: Not expected to occur; not present. 0.5: Recorded on adjacent connecting site. 1: Known to occur, or expected to occur, based on 'recent' surveys.
What essential life processes does the site support?		0: Not habitat 0.3: Dispersal 0.7: Foraging 1: Breeding
What is the desntiy of species known to utilise the site?		Score ranges from… 0: Not expected to occur; density is zero…to… 1: Population density likely to be close to/at the maximum carrying capacity for the species.
What is the role of the site population in regards to the overall species population?		0: Not an important population. 0.3: Potentially an important population. 0.7: Likely to be an important population. 1: Important population is present. All Malleefowl populations are considered equally important for protection and recovery.
Threats Sub-score Matrix		
Feral predators	10%	0: Evidence of substantial feral predators (foxes, feral cats) on site (multiple individuals) 0.5: Evidence of low density of feral predators on site. 1: No evidence of feral predators.
Fire	40%	0: Site is in a bushfire prone area (as per DFES map of bushfire prone areas) with no current bushfire management plan prepared or implemented. 0.5: Site is in a bushfire prone area, with current bushfire management plan prepared and implemented. 1: Site is not in a bushfire prone area.
Grazing	40%	0: Evidence of substantial grazing activities. 0.5: Possibly irregular grazing occurs. 1: No evidence of grazing.
Clearing risk	10%	0: Current or approved cleared areas and active operations immediately adjacent to more than 50% of site boundary. 0.3: Cleared areas immediately adjacent to 25-50% of site boundary AND active operations within 1 km of site. 0.6: Cleared areas immediately adjacent to 25-50% of site boundary OR active operations within 1 km of site. 0.8: Cleared areas immediately adjactent to less than 25% of site boundary, and no active operations within 1km of site. 1: No cleared areas or proposed activities within 1 km of site.

Table A2 Western Spiny-tailed Skink Habitat Quality Score Methods

Component	Weighting (%)	Scoring System
Site Condition	**20%**	
What is the structure and condition of the vegetation on the site?		Scored on vegetation condition rating: 0: Completely degraded 0.2: Degraded 0.4: Good 0.6: Very Good 0.8: Excellent 1: Pristine
What relevant habitat features are on the site (for foraging, shelter, breeding)?		0: Site has no suitable habitat features 0.5: Approximately 50% of site has suitable habitat features. 1: Entire site has suitable habitat features. Western Spiny-Tailed Skink habitat: known to be locally abundant in areas comprising of York Gum woodlands (good condition or better) on clay and loams flats. Must have large numbers of fallen logs, with longer logs preferred.
Site Context	**30%**	
What is the connectivity with other suitable/known habitat or remnants?		0: Site is effectively isolated 0.4: Site is continuous with extensive native vegetation but does not form part of an ecological corridor or important remnant or refuge 0.7: Site forms a medium to large area of remnant vegetation. 1: Site is part of an ecological corridor.
What is the species mobility/ dispersal capacity?		0: Species is highly mobile and expected to migrate to nearby suitable sites. 0.5: Species has some ability to migrate, possible suitable sites within range. 1: Species is highly restricted in mobility and unlikely to be able to migrate. Western Spiny-tailed Skink range: Records from SA indicate that this species has a small home range (~1.5ha).
What threats occur on or near site?		See Threats Sub-score Matrix (below). Western Spiny-tailed Skink threats: habitat clearing, reduced tree stock, predators, changes to natural processes that generate logs and hollows, firewood collecting.
Species Stocking Rate	**50%**	Species stoking rate weighted low due to species mobility.
What is the presence of the species on the site? (i.e. confirmed/ modelled).		0: Not expected to occur; not present. 0.5: Recorded on adjacent connecting site. 1: Known to occur, or expected to occur, based on 'recent' surveys.
What essential life processes does the site support?		0: Not habitat 0.3: Dispersal 0.7: Foraging 1: Breeding

Component	Weighting (%)	Scoring System
What is the desntiy of species known to utilise the site?		Score ranges from… 0: Not expected to occur; density is zero…to… 1: Population density likely to be close to/at the maximum carrying capacity for the species.
What is the role of the site population in regards to the overall species population?		0: Not an important population. 0.3: Potentially an important population. 0.7: Likely to be an important population. 1: Important population is present.
Threats Sub-score Matrix		
Feral predators	60%	0: Evidence of substantial feral predators (foxes, feral cats) on site (multiple individuals) 0.5: Evidence of low density of feral predators on site. 1: No evidence of feral predators.
Habitat recruitment (trees)	10%	Threats that reduce recruitment of trees will ultimately impact on availability of logs. 0: Current processes expected to lead to loss of the trees or tree recruitment (e.g. land clearing, grazing, rising water tables). 0.5: Current processes might lead to loss of trees (e.g. wildfire). 1: Current processes are expected to balance loss of trees with planting of trees.
Habitat loss (logs)	30%	Habitat areas are defined as large trees or logs with suitable hollows and crevices. 0: Current processes expected to lead to loss of logs (e.g. firewood collection, land clearing) 0.5: Current processes expected to lead to loss of logs (e.g. wildfire) 1: Current processes are expected to balance loss of logs with addition of alternate refugia.

Table A3 Gilled Slender Blue-Tongue Habitat Quality Score Methods

Component	Weighting (%)	Scoring System
Site Condition	**20%**	
What is the structure and condition of the vegetation on the site?		Scored on vegetation condition rating: 0: Completely degraded 0.2: Degraded 0.4: Good 0.6: Very Good 0.8: Excellent 1: Pristine
What relevant habitat features are on the site (for foraging, shelter, breeding)?		0: Site has no suitable habitat features 0.5: Approximately 50% of site has suitable habitat features. 1: Entire site has suitable habitat features. Gilled Slender Blue-Tongue habitat: the species is only known to occur in a few areas that have loamy soils in dense low vegetation cover (e.g. wattle woodlands) rocky areas or on heavy red soil. Locally, the species has been recorded in rocky environments along both Karara and Mungada ridge, as well as Koolanooka Hills.
Site Context	**30%**	
What is the connectivity with other suitable/known habitat or remnants?		0: Site is effectively isolated 0.4: Site is continuous with extensive native vegetation but does not form part of an ecological corridor or important remnant or refuge 0.7: Site forms a medium to large area of remnant vegetation. 1: Site is part of an ecological corridor.
What is the species mobility/ dispersal capacity?		0: Species is highly mobile and expected to migrate to nearby suitable sites. 0.5: Species has some ability to migrate, possible suitable sites within range. 1: Species is highly restricted in mobility and unlikely to be able to migrate. Gilled Slender Blue-Tongue range: very limited in distribution and is expected, restricted to rocky areas.
What threats occur on or near site?		See Threats Sub-score Matrix (below). Gilled Slender Blue-Tongue threats: clearance of habitat (Especially in the case of mining, mining infrastructure and agriculture), degradation of existing habitat due to rising water tables and salinity, grazing by rabbits, feral goats and domestic livestock, fragmentation, vehicle strike, predation from feral cats and corvids (often attracted by waste/ landfill sites), discontinuation or modification of natural processes (such as fire) that generate hollows, logs and regenerate woodlands.
Species Stocking Rate	**50%**	
What is the presence of the species on the site? (i.e. confirmed/ modelled).		0: Not expected to occur; not present. 0.5: Recorded on adjacent connecting site. 1: Known to occur, or expected to occur, based on 'recent' surveys.

Component	Weighting (%)	Scoring System
What essential life processes does the site support?		0: Not habitat 0.3: Dispersal 0.7: Foraging 1: Breeding
What is the desntiy of species known to utilise the site?		Score ranges from… 0: Not expected to occur; density is zero…to… 1: Population density likely to be close to/at the maximum carrying capacity for the species.
What is the role of the site population in regards to the overall species population?		0: Not an important population. 0.3: Potentially an important population. 0.7: Likely to be an important population. 1: Important population is present.
Threats Sub-score Matrix		
Predators	40%	0: Evidence of substantial feral predators (foxes, feral cats) on site (multiple individuals) 0.5: Evidence of low density of feral predators on site. 1: No evidence of feral predators.
Grazing	20%	0: Evidence of substantial grazing activities. 0.5: Possibly irregular grazing occurs. 1: No evidence of grazing.
Habitat fragmentation	40%	Habitat areas are defined as large trees or logs with suitable hollows and crevices. 0: Habitat areas are more than 300m apart. 0.5: Habitat areas 100m apart. 1: Habitat areas are well connected.

Table A4 Blue Hills PEC Habitat Quality Score Methods

Component	Weighting (%)	Scoring System
Site Condition	**75%**	Site condition weighted high as suitable landform and floristic values are required to meet the PEC definition.
What is the structure and condition of the vegetation on the site?		Scored on vegetation condition rating: 0: Completely degraded 0.2: Degraded 0.4: Good 0.6: Very Good 0.8: Excellent 1: Pristine
What are the floristic values of the site?		0: Site does not contain floristic values comparable with Blue HIlls PEC criteria. 0.5: Site contains floristic values that align with Blue Hills PEC species and structure but do not fully satisfy requirements. 1: Site contains floristic values that meet criteria for Blue Hills PEC. Blue Hills PEC floristic values: indicator species and structure?
Is the site landform suitable for the ecological community?		0: Site is not on suitable landform. 0.5: Site landform is altered but expected to meet ecological community requirements. 1: Site is on suitable unaltered landform. Blue Hills PEC landform requirements: banded iron formation crests and slopes.
Site Context	**25%**	
What is the connectivity with other remnant native vegetation?		0: Site is effectively isolated 0.4: Site is continuous with extensive native vegetation but does not form part of an ecological corridor or important remnant or refuge 0.7: Site forms a medium to large area of remnant vegetation. 1: Site is part of an ecological corridor.
What is the location compared to the ecological community distribution?		0: Site is outside of the expected potential range of teh ecological community. 0.5: Site is at the geographical edge of the expected potential range of the ecological community. 1: Species is within the primary area of the ecological community occurrence.
What threats occur on or near site?		See Threats Sub-score Matrix (below). Blue Hills PEC threats: clearing for mining, grazing, weeds, fire regime.
Threats Sub-score Matrix		
Weeds	30%	0: Substantial weed coverage - more than 50% weed coverage 0.3: 25-50% weed coverage 0.6: 10-25% weed coverage 1: Very few weeds present - less than 10% weed coverage or comparable to baseline weed levels

Component	Weighting (%)	Scoring System
Grazing	20%	0: Evidence of substantial grazing activities. 0.5: Possibly irregular grazing occurs. 1: No evidence of grazing.
Clearing risk	50%	0: Current or approved cleared areas and active operations immediately adjacent to more than 50% of site boundary. 0.3: Cleared areas immediately adjacent to 25-50% of site boundary AND active operations within 1 km of site. 0.6: Cleared areas immediately adjacent to 25-50% of site boundary OR active operations within 1 km of site. 0.8: Cleared areas immediately adjactent to less than 25% of site boundary, and no active operations within 1km of site. 1: No cleared areas or proposed activities within 1 km of site.

Table A5* Lepidosperma *sp. Blue Hills Habitat Quality Score Methods

Component	Weighting (%)	Scoring System
Site Condition	**30%**	
What is the structure and condition of the vegetation on the site?		Scored on vegetation condition rating: 0: Completely degraded 0.2: Degraded 0.4: Good 0.6: Very Good 0.8: Excellent 1: Pristine
Is the site landform suitable for the taxon?		0: Site is not on suitable landform. 0.5: Site landform is altered but expected to meet ecological community requirements. 1: Site is on suitable unaltered landform. Lepidosperma sp. Blue Hills: occurs on seasonally wet brown to red sandy loam at the base of granite outcrops or across moderate to steeply inclined hillslopes of rocky magnetite and laterite banded ironstone.
Site Context	**50%**	Site context weighted high as site location within taxon range and minimising threats are critical for viability of the taxon.
What is the connectivity with other remnant native vegetation?		0: Site is effectively isolated 0.4: Site is continuous with extensive native vegetation but does not form part of an ecological corridor or important remnant or refuge 0.7: Site forms a medium to large area of remnant vegetation. 1: Site is part of an ecological corridor.
What is the location compared to the taxon distribution?		0: Site is outside of the expected potential range of teh ecological community. 0.5: Site is at the geographical edge of the expected potential range of the ecological community. 1: Species is within the primary area of the ecological community occurrence.
What threats occur on or near site?		See Threats Sub-score Matrix (below). Lepidosperma sp. Blue Hills threats: clearing of habitat.
Species Stocking Rate	**20%**	
What is the presence of the species on the site? (i.e. confirmed/ modelled).		0: Not expected to occur; not present. 0.1: Recorded on adjacent connecting site. 0.2: <1000 0.4: 1000 - 2000 0.6: 2000 - 5000 0.8: 5000 - 10,000 1: >10,000
What essential life processes does the site support?		Determined based on area (proportion) of veg types O and P, Blue Hills PEC or Tallering land system within site. 0: 0% 0.5: 50% 1: 100%

Component	Weighting (%)	Scoring System
What is the density of species known to utilise the site?		Highest density at Mt Karara ~35,000 plants within <350ha = greater than 100 plants/ ha. 0: Taxon not recorded 0.5: 50 plants/ ha 1: Population density likely to be close to/ at the maximum carrying capacity for the taxon >100 plants/ha.
What is the role of the site population in regards to the overall species population?		Considers whether key source population for seed dispersal, genetic diversity or near the limit of the taxon range. 0: Not an important population. 0.3: Potentially an important population. 0.7: Likely to be an important population. 1: Important population is present.
Threats Sub-score Matrix		
Clearing risk	100%	0: Current or approved cleared areas and active operations immediately adjacent to more than 50% of site boundary. 0.3: Cleared areas immediately adjacent to 25-50% of site boundary AND active operations within 1 km of site. 0.6: Cleared areas immediately adjacent to 25-50% of site boundary OR active operations within 1 km of site. 0.8: Cleared areas immediately adjactent to less than 25% of site boundary, and no active operations within 1km of site. 1: No cleared areas or proposed activities within 1 km of site.

APPENDIX 2. ENVIRONMENTAL OFFSETS CALCULATOR

Table 1: Direct offsets from on-ground management of threatening processes

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999

2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Malleefowl
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community Excel for	No		Area			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat Excel for	Yes	Proposed direct impact - KIOP MLE mitigated disturbance footprint	Area	692.6	Hectares	EPBC Rev3
			Quality	8	Scale 0-10	
			Total quantum of impact	554.08	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset									
									Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0								
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
Threatened species habitat																				
Area of habitat	Yes	554.08	Adjusted hectares	Management of threatening process and establishment of exclusion zones	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	990.4	Risk of loss (%) without offset	2%	Risk of loss (%) with offset	0%	19.51	80%	15.61	15.00	88.90	16.04%	No	
									Future area without offset (adjusted hectares)	970.9	Future area with offset (adjusted hectares)	990.4								
					Time until ecological benefit	5	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8	1.00	80%	0.80	0.79				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	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 met?	Cost ($ total)	Information source

Table 2: Direct offsets by land restoration

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Malleefowl
EPBC Act status	Vulnerable
Annual probability of extinction Based on IUCN category definitions	0.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community Excel for	No		Area			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat Excel for	Yes	Proposed direct impact - KIOP MLE mitigated disturbance footprint	Area	692.6	Hectares	EBD Rev3
			Quality	8	Scale 0-10	
			Total quantum of impact	554.08	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset									
									Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0								
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
Threatened species habitat																				
Area of habitat	Yes	554.08	Adjusted hectares	Management of threatening process and establishment of exclusion zones	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	1000	Risk of loss (%) without offset	2%	Risk of loss (%) with offset	0%	19.70	80%	15.76	15.14	407.71	73.58%	No	
									Future area without offset (adjusted hectares)	980.3	Future area with offset (adjusted hectares)	1000.0								
					Time until ecological benefit	20	Start quality (scale of 0-10)	2	Future quality without offset (scale of 0-10)	2	Future quality with offset (scale of 0-10)	8	6.00	70%	4.20	4.04				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	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 met?	Cost ($ total)	Information source

Table 1: Direct offsets from on-ground management of threatening processes

Offsets Assessment Guide

For use in determining offsets under the *Environment Protection and Biodiversity Conservation Act 1999*
2 October 2012

This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Egernia stokesii badia
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community Excel for	No		Area			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat Excel for	Yes	Habitat disturbance by mining activities - KIOP MLE Proposal	Area	239.1	Hectares	ERD v3
			Quality	8	Scale 0-10	
			Total quantum of impact	191.28	Adjusted hectares	
Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset									
									Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0								
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
Threatened species habitat																				
Area of habitat	Yes	191.28	Adjusted hectares	Proposed direct impact - onground management in KIOP MLE exclusion areas	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	990.4	Risk of loss (%) without offset	2%	Risk of loss (%) with offset	0%	19.51	80%	15.61	12.30	43.40%	No		
									Future area without offset (adjusted hectares)	970.9	Future area with offset (adjusted hectares)	990.4				83.01				
					Time until ecological benefit	5	Start quality (scale of 0-10)	8	Future quality without offset (scale of 0-10)	7	Future quality with offset (scale of 0-10)	8	1.00	80%	0.80	0.75				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	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 met?	Cost ($ total)	Information source

Table 2: Direct offsets by land restoration

Offsets Assessment Guide

For use in determining offsets under the Environment Protection and Biodiversity Conservation Act 1999
2 October 2012
This guide relies on Macros being enabled in your browser.

Matter of National Environmental Significance	
Name	Egernia stokesii badia
EPBC Act status	Endangered
Annual probability of extinction Based on IUCN category definitions	1.2%

Key to Cell Colours
User input required
Drop-down list
Calculated output
Not applicable to attribute

Impact calculator

Protected matter attributes	Attribute relevant to case?	Description	Quantum of impact		Units	Information source
Ecological communities						
Area of community Excel for	No		Area			
			Quality			
			Total quantum of impact	0.00		
Threatened species habitat						
Area of habitat Excel for	Yes	Proposed direct impact - KIOP MLE mitigated disturbance footprint	Area	239.1	Hectares	ERD v3
			Quality	8	Scale 0-10	
			Total quantum of impact	191.28	Adjusted hectares	

Offset calculator

Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	Proposed offset	Time horizon (years)		Start area and quality		Future area and quality without offset		Future area and quality with offset		Raw gain	Confidence in result (%)	Adjusted gain	Net present value (adjusted hectares)	% of impact offset	Minimum (90%) direct offset requirement met?	Cost ($ total)	Information source
Ecological Communities																				
Area of community	No				Risk-related time horizon (max. 20 years)		Start area (hectares)		Risk of loss (%) without offset		Risk of loss (%) with offset									
									Future area without offset (adjusted hectares)	0.0	Future area with offset (adjusted hectares)	0.0								
					Time until ecological benefit		Start quality (scale of 0-10)		Future quality without offset (scale of 0-10)		Future quality with offset (scale of 0-10)									
Threatened species habitat																				
Area of habitat	Yes	191.28	Adjusted hectares	Restoration of habitat in innovation park.	Time over which loss is averted (max. 20 years)	20	Start area (hectares)	300	Risk of loss (%) without offset	2%	Risk of loss (%) with offset	0%	9.67	70%	6.77	5.33	108.59	56.77%	No	
									Future area without offset (adjusted hectares)	380.3	Future area with offset (adjusted hectares)	390.0								
					Time until ecological benefit	20	Start quality (scale of 0-10)	2	Future quality without offset (scale of 0-10)	2	Future quality with offset (scale of 0-10)	7	5.00	70%	3.50	2.76				
Protected matter attributes	Attribute relevant to case?	Total quantum of impact	Units	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 met?	Cost ($ total)	Information source

WA Environmental Offsets Calculator

Step 1: Determining conservation significance

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores (Or, if appropriate, manual data entry permitted)

Area / feature (Impact site)

Conservation significance determination for the environmental value impacted	
Description	Gilled slender blue-tongue
Type of environmental value	Species (flora/fauna)
Conservation significance of environmental value	Rare/threatened Species - vulnerable
Conservation significance score	0.2%

WA Environmental Offsets Calculator

Step 2: Calculating significant residual impact

Clear Data

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Gilled Slender Blue-tongue

Area (impact site)

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact		Significant impact (hectares)	115.39
		Quality (scale)	5.50
		Total quantum of impact	63.46

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description				
Rehabilitation Credit	The whole of the habitat area will be rehabilitated at KIOP (no permanent disturbance features such as open voids)	Proposed rehabilitation (area in hectares)	115.39	Time until ecological benefit (years)	20.00
		Current quality of rehabilitation site (scale)	5.50	Confidence in rehabilitation result (%)	50.0%
		Future quality WITHOUT rehabilitation (scale)	1.50	Rehabilitation credit	19.40
		Future quality WITH rehabilitation (scale)	5.00		

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	63.46
	Rehabilitation credit	19.40
	Significant residual impact	44.06

Notes:

Confidence in the effectiveness of rehabilitation to restore habitat for the Gilled Slender Blue-tongue has been set to 50% to reflect limited understanding of species' ecology. Habitat quality values are taken from Umwelt (2025). Karara Life of Mine Expansion, Draft Offset Strategy V2, 7 November 2025.

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Gilled Slender Blue-tongue	Significant impact (step 2, part A)	115.39
		Rehabilitation credit (step 2, part B)	19.40
		Significant residual impact (step 2, part C)	44.06

***Area* (offset site)**

Offset calculation *Area*

Offsets calculation							
	Description	Proposed offset (area in hectares)	990.40	Duration of offset implementation (maximum 20 years)	20.00	Offset value	59.77
	On-ground works in exclusion areas at KIOP	Current quality of offset site (scale)	5.50	Time until offset site secured (years)	0.00	What-if Analysis	135.6%
		Future quality WITHOUT offset (scale)	5.00	Risk of future loss WITHOUT offset (%)	2.0%		
		Future quality WITH offset (scale)	6.00	Risk of future loss WITH offset (%)	0.0%	What-if Analysis Reinstate Formula	
		Time until ecological benefit (years)	5.00				
		Confidence in offset result (%)	50.0%			OFFSET ADEQUATE?	YES

Notes:

Default risk of loss for Perenjori local area (where disturbance will occur) is 1.97% (Threatened Species Recovery Hub, 2017. *Guidance for deriving 'Risk of Loss' estimates when* government *evaluating biodiversity offset proposals under the EPBC Act*). Confidence in on-ground management of threatening factors has been set to 50% to reflect limited understanding of species' ecology.

WA Environmental Offsets Calculator

Step 1: Determining conservation significance

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores (Or, if appropriate, manual data entry permitted)

Area / feature (Impact site)

Conservation significance determination for the environmental value impacted		
Conservation significance	Description	Blue Hills PEC
	Type of environmental value	Ecological community
	Conservation significance of environmental value	Priority ecological community
	Conservation significance score	0.1%

Please select *area* or *feature* for the calculations	Area

WA Environmental Offsets Calculator

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Blue Hills PEC

Area (impact site)

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact		Significant impact (hectares)	98.00
		Quality (scale)	8.50
		Total quantum of impact	83.30

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description				
Rehabilitation Credit		Proposed rehabilitation (area in hectares)	98.00	Time until ecological benefit (years)	32.00
		Current quality of rehabilitation site (scale)	1.63	Confidence in rehabilitation result (%)	0.0%
		Future quality WITHOUT rehabilitation (scale)	2.33	Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)	6.00		

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	83.30
	Rehabilitation credit	0.00
	Significant residual impact	83.30

Notes:

No rehabilitation credits have been claimed. This has been done by setting the 'confidence' value to 0%. Offset obligation may have been over-estimated as a result of this conservative approach.

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Blue Hills PEC	Significant impact (step 2, part A)	98.00
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	83.30

***Area* (offset site)**

Offset calculation
Area

Offsets calculation

Description						
	Proposed offset (area in hectares)	495.00	Duration of offset implementation (maximum 20 years)	20.00	Offset value	83.90
Land restoraton at Innovation Park: Establishment of nursery to produce seeds, planting of tubestock, weed management, management of feral herbivores, fire mgt	Current quality of offset site (scale)	1.50	Time until offset site secured (years)	10.00		100.7%
	Future quality WITHOUT offset (scale)	2.50	Risk of future loss WITHOUT offset (%)		(applied to step 2, part A)	
	Future quality WITH offset (scale)	5.00	Risk of future loss WITH offset (%)			
	Time until ecological benefit (years)	32.00				
	Confidence in offset result (%)	70.0%			OFFSET ADEQUATE?	YES

Notes:

Risk of loss for restoration area has been set to '0', as land proposed for restoration is heavily modified by agricultural activities. Default risk of loss for Morawa local government area is 2.48% (Threatened Species Recovery Hub, 2017. *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act*).

WA Environmental Offsets Calculator

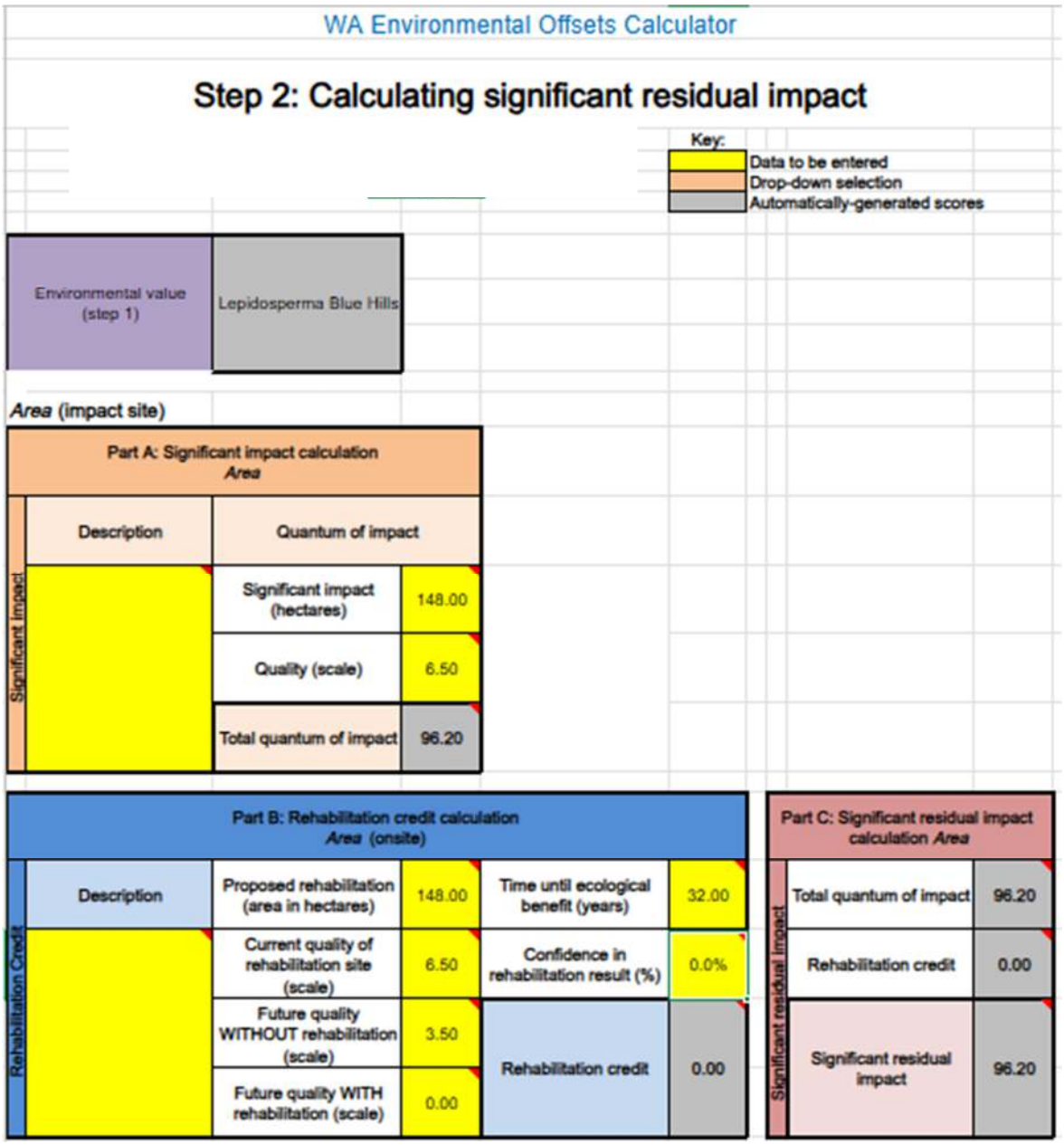
Step 1: Determining conservation significance

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores (Or, if appropriate, manual data entry permitted)

Area / feature (Impact site)

Conservation significance determination for the environmental value impacted		
Conservation significance	Description	Lepidosperma Blue Hills
	Type of environmental value	Species (flora/fauna)
	Conservation significance of environmental value	Priority species
	Conservation significance score	0.1%

Please select *area* or *feature* for the calculations	Area



WA Environmental Offsets Calculator

Step 2: Calculating significant residual impact

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Lepidosperma Blue Hills

Area **(impact site)**

Part A: Significant impact calculation *Area*

	Description	Quantum of impact	
Significant impact		Significant impact (hectares)	148.00
		Quality (scale)	6.50
		Total quantum of impact	96.20

Part B: Rehabilitation credit calculation *Area* (onsite)

	Description				
Rehabilitation Credit		Proposed rehabilitation (area in hectares)	148.00	Time until ecological benefit (years)	32.00
		Current quality of rehabilitation site (scale)	6.50	Confidence in rehabilitation result (%)	0.0%
		Future quality WITHOUT rehabilitation (scale)	3.50	Rehabilitation credit	0.00
		Future quality WITH rehabilitation (scale)	0.00		

Part C: Significant residual impact calculation *Area*

Significant residual impact	Total quantum of impact	96.20
	Rehabilitation credit	0.00
	Significant residual impact	96.20

Notes:

No rehabilitation credits have been claimed. This has been done by setting the 'confidence' value to 0%. Offset obligation may have been over-estimated as a result of this conservative approach.

WA Environmental Offsets Calculator

Step 3: Calculating offsets

Key:
- Data to be entered
- Drop-down selection
- Automatically-generated scores

Environmental value (step 1)	Lepidosperma Blue Hills	Significant impact (step 2, part A)	148.00
		Rehabilitation credit (step 2, part B)	0.00
		Significant residual impact (step 2, part C)	96.20

***Area* (offset site)**

Offset calculation *Area*

Offsets calculation

Description						
	Proposed offset (area in hectares)	405.00	Duration of offset implementation (maximum 20 years)	20.00	Offset value	96.10
Land restoraton at Innovation Park: Establishment of nursery to produce seeds, planting of tubestock, weed management, management of feral herbivores, fire mgt	Current quality of offset site (scale)	1.50	Time until offset site secured (years)	0.00		99.9%
	Future quality WITHOUT offset (scale)	2.50	Risk of future loss WITHOUT offset (%)		(applied to step 2, part A)	
	Future quality WITH offset (scale)	6.00	Risk of future loss WITH offset (%)			
	Time until ecological benefit (years)	32.00				
	Confidence in offset result (%)	70.0%			OFFSET ADEQUATE?	NO

Notes:

Risk of loss for restoration area has been set to '0', as land proposed for restoration is heavily modified by agricultural activities. Default risk of loss for Morawa local government area is 2.48% (Threatened Species Recovery Hub, 2017. *Guidance for deriving 'Risk of Loss' estimates when evaluating biodiversity offset proposals under the EPBC Act*).