

Appendix 5 Environmental Offsets Discussion, (GHD, November 2016)



Arafura Resources Limited

Nolans Project Environmental Offsets Discussion

November 2016

Table of contents

1.	Introduction.....	1
2.	Environmental offsets under the EPBC Act	2
2.1	What are environmental offsets?	2
2.2	When do EPBC Act offsets apply?	2
2.3	Types of Offsets.....	3
2.4	How are EPBC Act offsets determined?	4
3.	Offset delivery options for the Black-footed Rock-wallaby and Great Desert Skink at the Nolans Project	7
4.	Future management and monitoring of offsets	9
5.	References	10

Appendices

Appendix A - Requirements and definitions relevant to the EPBC Act

1. Introduction

GHD was engaged by Arafura Resources Limited (Arafura Resources) to provide a discussion about offsets in order to:

- demonstrate an understanding of the Commonwealth *Environment Protection and Biodiversity Conservation* (EPBC) Act 1999 Environmental Offsets Policy (SEWPaC 2012) in the context of the Nolans project, and
- outline direct and indirect offsets which may serve to compensate for the potential impacts that the project would have on two EPBC Act listed (Vulnerable) species that were detected within the study area, the Black-footed Rock-wallaby (MacDonnell Ranges race) (*Petrogale lateralis*) and Great Desert Skink (*Liopholis kintorei*).

The Nolans Project (the Project), undertaken by Arafura Resources, targets the Nolans Bore mineral deposit for rare earth elements, approximately 135 km north west of Alice Springs, Northern Territory (NT). The Project involves several key activities during construction and operations which have the potential to impact upon biodiversity. These include:

- Clearing of vegetation and fauna habitat;
- Planned and/or unplanned fire;
- Collisions between fauna and traffic;
- Storage and use of potentially hazardous substances;
- Introduction and/or spread of weeds (covered in the Weed Management Plan); and
- Increase in population size of native and/or non-native predators.

The Black-footed Rock-wallaby and Great Desert Skink are both listed as Vulnerable under the Commonwealth EPBC Act 1999, and Near Threatened and Vulnerable respectfully, under the *Territory Parks and Wildlife Conservation* (TPWC) Act 2000 (Northern Territory). Given the proximity of known records and habitat to the proposed mine site and associated infrastructure corridors (roads and borefields), the proposed action may impact on both species.

2. Environmental offsets under the EPBC Act

2.1 What are environmental offsets?

In October 2012, the Commonwealth Department of the Environment and Energy (then SEWPAC; Department of Sustainability, Environment, Water, Population and Communities) released its Environmental Offsets Policy: *Environment Protection and Biodiversity Conservation Act 1999* (SEWPaC 2012).

The policy intends to provide guidance, consistency, transparency and flexibility in delivering good environmental outcomes. SEWPaC (2012) defines environmental offsets as:

“...measures that compensate for the residual adverse impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after avoidance and mitigation measures.”

That is, offsets are intended to compensate for residual significant impacts, and do not reduce the likely impacts of a proposed action. ‘Residual impacts’ are those that remain and are unavoidable, even with mitigation. Under the EPBC Act, offsets are only required if residual impacts are significant, as defined under the EPBC Act (Appendix A).

2.2 When do EPBC Act offsets apply?

Offsets are usually considered during the assessment phase of a project, but not until all reasonable avoidance and mitigation measures have been considered; or acceptable reasons are provided as to why avoidance or mitigation of impacts is not reasonably achievable.

In order to determine if an offset is appropriate, Arafura Resources will be required to fully understand the impacts of the proposed action. This can be determined through investigation of five questions:

1. What is the nature of the likely impacts on protected matters?
2. Can impacts on protected matters be avoided?
3. Can impacts on protected matters be mitigated?
4. Are the residual impacts likely to be significant?
5. Are offsets a suitable approach?

2.2.1 Potential Impacts on the Black-footed Rock-wallaby and Great Desert Skink

Potential impacts that the Nolans Project may have on the Black-footed Rock-wallaby and Great Desert Skink are explored in detail in the Nolans Project EIS (GHD 2016) and identified as:

- Clearing of breeding and/foraging habitat (includes harming or killing of animals directly);
- Dust generated by construction, mining and processing activities;
- Noise generated by construction, mining and processing activities;
- Wildfire that may result unintentionally from construction, mining and processing activities;
- Introduction and/or spread of exotic plants and animals;

- Poisoning of fauna from drinking tailings dam water and residue storage facility;
- Lowering or contamination of the water table;
- Artificial light generated by mining and processing activities; and
- Injury and death of fauna from collisions with vehicles.

The predicted extent and severity of these impacts varies, as does the extent to which they are able to be controlled through avoidance and mitigation. It is clear however, that with the proposed mine operation, it is unlikely that some of the potential impacts described above can be entirely mitigated. Given the likelihood of residual impacts on Black-footed Rock-wallaby and Great Desert Skink after mitigation, offsets under the EPBC Act may be relevant.

Residual impacts on the Black-footed Rock-wallaby and Great Desert Skink are not quantified here, but it is understood that they would need to be quantified by Arafura Resources as part of an offsets proposal, prior to offsets being determined for the Project.

Offsets are not required for approval of all projects. Offsets are only required for projects where all reasonable actions to avoid or mitigate environmental damage have been investigated, and the remaining residual impact is likely to be significant, as defined under the EPBC Act.

2.3 Types of Offsets

Offsets for the Nolans Project would be delivered as an 'offsets package', which is a suite of actions that Arafura Resources commits to undertake, in order to compensate for the residual significant impact of the project. Under the policy, offsets should directly correlate to the impacts of a proposed action.

An offsets package implemented by Arafura Resources would be based on 'direct offsets', but could include 'other compensatory measures' (indirect). A minimum of 90% of the offset requirements for any given impact must be direct offsets, unless it can be shown that greater benefit can be achieved through other compensatory measures, or there is sufficiently high scientific uncertainty regarding the expected benefits of the direct offset proposed.

Offset actions (direct or indirect) made prior to the impact occurring are called 'advanced offsets'.

2.3.1 Direct offsets

Arafura Resources has considered "actions that provide a measurable conservation gain for an impacted protected matter". Conservation gain is the benefit that a direct offset delivers to the protected matter, which maintains or increases its viability or reduces any threats of damage, destruction or extinction. Conservation gains may be achieved by:

- improving existing habitat for the protected matter;
- creating new habitat for the protected matter;
- reducing threats to the protected matter;
- increasing the values of a heritage place, and/or
- averting the loss of a protected matter or its habitat that is under threat.

Given that the Black-footed Rock-wallaby and Great Desert Skink habitat of the Nolans Project study area is extant, remnant and largely intact, and not under direct threat of clearing or destruction, nor surrounded by habitat that is cleared or destroyed; offsets for these species at the Nolans Project are most likely achievable through the first and third factors (i.e. improving existing habitat and reducing known threats to the species' and their habitats).

Offsets implemented by Arafura Resources would likely include actions such as the ongoing management and improvement of remaining habitat through enhanced management of potentially detrimental factors such as predation, grazing and fire.

2.3.2 Other compensatory measures (Indirect offsets)

Other compensatory measures are: “those actions that do not directly offset the impacts on the protected matter, but are anticipated to lead to benefits for the impacted protected matter, for example funding for research or educational programs.”

The Environmental Offset Assessment Guide stipulates that research or education programs need to be “Priority Actions” (i.e., those identified in approved governmental documents such as Recovery Plans).

Given the relatively limited understanding as to why Black-footed Rock-wallaby and Great Desert Skink populations have declined from much of their ranges across central Australia, there would appear to be innumerable research options that would satisfy suitability. Note that there are criteria relating to research or education programs that determine the suitability of such programs as offsets under the EPBC Act.

The National Black-footed Rock-wallaby and Great Desert Skink Recovery Plans (Pearson 2013, McAlpin 2001) lists 10 and 30 actions respectively, to achieve specific objectives as part of the species’ recovery. Each of these is likely to qualify as a “Priority Action” as defined under Indirect Offsets in the Environmental Offset Assessment Guide.

2.3.3 Advanced offsets

Offset actions (e.g. protection or improvement of habitat) made prior to the impact occurring are called advanced offsets (SEWPaC 2012). Arafura Resources, when looking to establish advanced offsets; will need to discuss these with the Commonwealth Department of the Environment and Energy as early as possible. Advanced offsets that may be considered are those that can be shown to deliver a conservation gain after the commencement of the EPBC Act (16 July 2000). Higher value is placed on offsets that achieve a conservation gain in a shorter time period, and this can reduce overall offset requirements.

Arafura Resources would need to monitor and record baseline data associated with the establishment of the offset, and improvements over time.

For the Black-footed Rock-wallaby and Great Desert Skink at the Nolans Project, the ability of Arafura Resources to achieve advanced offsets would depend on the timeframe of the proposed impact. If the impact occurs immediately, then advanced offsets are unlikely to be achieved. However, if the extent of impact progresses over a number of years (e.g. 10 -15 years) then land improvement measures (e.g., beneficial changes to exotic predators, fire and grazing management) in adjacent areas may provide benefits that compensate for the later component of the impact. This would need to be discussed with the Commonwealth Department of the Environment and Energy.

2.4 How are EPBC Act offsets determined?

In accordance with recommendations from SEWPaC (2012) suitable offsets to be considered by Arafura Resources will:

- 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;
- be built around direct offsets but may include other compensatory measures;

- be in proportion to the level of statutory protection that applies to the protected matter;
- be of a size and scale proportionate to the residual impacts on the protected matter;
- effectively account for and manage the risks of the offset not succeeding;
- 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);
- be efficient, effective, timely, transparent, scientifically robust and reasonable; and
- have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.

Determining and securing environmental offsets is generally done on a case-by-case basis, and can become technically complicated. For this reason, the following information is limited to the main components of the EPBC Offset requirements and particulars; and does not delve into the technical details that are likely to warrant consideration.

2.4.1 The Offset assessment guide

Offsets will be calculated using the Commonwealth Department's Environmental Offsets Assessment Guide. The guide is a spreadsheet that is used to determine the suitability of offset proposals under the EPBC Act in a clear and consistent manner.

Specific information about impacts and offsets is required in order to calculate whether a proposed offset adequately compensates for the residual significant impacts of the proposed action. Specific quantitative and qualitative information includes:

- the size and nature of the impact of the proposed action;
- the size and nature of the proposed offset; and
- risks associated with delivery of the proposed offset.

To use the offsets assessment guide effectively, certain parameters for the protected matter and its habitat (in this case Black-footed Rock-wallaby and Great Desert Skink) must be quantified in detail. Parameters include (but are not limited to) the following:

Annual probability of Extinction (in the wild) – value based on criteria for the International Union for the Conservation of Nature (IUCN) Red List for threatened species. For example, for Vulnerable species such as the Black-footed Rock-wallaby and Great Desert Skink, the probability is considered to be at least 10% within 100 years.

Protected matter attribute – what attribute of the protected matter is being affected? For Black-footed Rock-wallaby and Great Desert Skink at the Nolans Project, the major impacts are likely to be increased mortality through predation by exotic predators, and decreased area of habitat, through land clearing and potentially changes in fire regimes and grazing pressures.

Quality score for area of habitat – how well the site supports the species, including three components:

- Site condition: in terms of threatened species' ecological requirements (e.g., vegetation condition and structure, diversity of habitat species present and number of relevant habitat features).
- Site context: relative importance in terms of its landscape position, considering the threatened species' connectivity needs (e.g., movement patterns, site proximity relative

to other areas of suitable habitat, and the site's role relative to the population or extent of the species).

- Species stocking rate: usage of the site, and/or density of a species at a site, including consideration of the site's role in regards to the overall species population viability or community extent.

The guide incorporates three measures of habitat quality: current habitat quality, future quality without offsets and future quality with offsets (i.e. the 'do-nothing' approach versus the active management/improvement approach). Given the nature of these components, and the known importance of the Nolans Project habitat for the Black-footed Rock-wallaby and Great Desert Skink population, the current habitat quality score for these species at the Nolans Project is likely to be high for Black-footed Rock-wallaby and moderate for Great Desert Skink.

Time over which loss is averted - the number of years over which changes in the level of risk to a proposed offset site can be considered and quantified (e.g., duration of a conservation covenant, or duration of active management and protection of habitat for the purpose of conservation gain). Longer time frames are valued more highly than shorter time frames.

Time until ecological benefit - the number of years it takes for the proposed offset habitat to improve to the point of conservation gain. For example, control of exotic predators as an offset measure would have a short timeframe, and could show measureable improvement within months, however gradual and subtle habitat improvement actions (e.g., management of fire and grazing) may take decades to provide the required improvement in habitat quality.

Risk of loss - the chance (%) that the offset habitat will be completely lost (i.e. no longer hold any value for the protected matter) over the foreseeable future (either the life of the offset or 20 years, whichever is shorter). For the Black-footed Rock-wallaby and Great Desert Skink at the Nolans Project, if the proposed offset site/s are within the immediately surrounding area (which would seem likely), then the risk of loss is expected to be very low. Active monitoring and management of that offset site for the Black-footed Rock-wallaby and Great Desert Skink would further reduce the risk of loss.

Confidence in result - describes the level of certainty (%) about the success of the proposed offset. For the Black-footed Rock-wallaby and Great Desert Skink at Nolans Project, this is likely to be difficult to determine because the causes of the species' historical decline remain relatively uncertain. Thus securing suitable habitat may not be sufficient to guarantee the success of the species in any area.

3. Offset delivery options for the Black-footed Rock-wallaby and Great Desert Skink at the Nolans Project

If offsets to compensate for impacts on the Black-footed Rock-wallaby and Great Desert Skink are required, then an appropriate offsets package would be developed by Arafura Resources in consultation with the Department of the Environment and Energy. An offsets proposal would be prepared using the EPBC Act Policy and Offsets assessment guide (SEWPaC, 2012), and include:

- a detailed and quantified determination of impacts on the Black-footed Rock-wallaby and Great Desert Skink;
- an estimation of the potential quantum of offset required;
- identification of suitable offset site/s; and
- an assessment of whether the proposed offset site/s would meet the proposal's EPBC Act offsetting requirements.

Indirect offsets (i.e. other compensatory measures) are likely to be easier to determine than direct offsets. The National Black-footed Rock-wallaby and Great Desert Skink Recovery Plans (Pearson 2013, McAlpin 2001) lists 10 and 30 actions respectively, to achieve specific objectives as part of the species' recovery. Each of these is likely to qualify as a "Priority Action" as defined under Indirect Offsets in the Environmental Offset Assessment Guide; and, as stated earlier, our relatively poor understanding of why the Black-footed Rock-wallaby and Great Desert Skink have declined across central Australia means that there are many research options that would be likely to satisfy suitability. Pearson (2013) and McAlpin (2001) identify exotic predator control, fire management, competing herbivore control and population monitoring as existing conservation measures in the Recovery Plans. Many of the management options relate to management of fire and exotic predators, as well as grazing, feral herbivores, and the participation of mining companies, pastoralist and Aboriginal landowners.

Direct offset measures, which are required for the bulk of the offsets package, are likely to be more difficult. SEWPaC (2012) states:

"For direct offsets, the securing of existing unprotected habitat as an offset only provides a conservation gain if that habitat was under some level of threat of being destroyed or degraded, and as a result of offsetting will instead be protected in an enduring way and actively managed to maintain or improve the viability of the protected matter."

The Black-footed Rock-wallaby and Great Desert Skink habitat surrounding the Nolans Project mine site is under relatively low level of threat, aside from threats produced by grazing, fire and exotic herbivores. The Black-footed Rock-wallaby and Great Desert Skink Recovery Plans list inappropriate fire regimes, exotic predators and exotic herbivores as the major current threats to the Black-footed Rock-wallaby and Great Desert Skink populations in the Nolans Project area.

Improvements to existing habitat, particularly with regard to reducing current threats, are perhaps the most likely achievable and measurable direct offset mechanism for the Nolans Project. Improvements in habitat quality for Great Desert Skink may be achieved through landscape-scale fire management, particularly aimed at increasing the patchiness of fire scars and therefore habitat across the landscape, also reducing the chance of large scale fires. Both species are likely to benefit from the landscape scale control of exotic predators such as cats and foxes. Mitigation of other impacts on habitat quality or population viability for Black-footed

Rock-wallaby and Great Desert Skink should also be considered in the broader Nolans Project area, including monitoring for, and control of, cats, foxes, exotic herbivores, prescribed and wild-fires.

One or more conservation agreements may be possible. According to SEWPaC (2012):

“...there is provision under Part 14 of the EPBC Act for the Commonwealth Minister to enter into a conservation agreement with a third party for the conservation of a protected matter. An EPBC Act conservation agreement can be used for implementing a range of management activities to benefit a protected matter, such as fencing off important habitat areas, undertaking weed and feral animal control or the establishment of compensatory habitat. They can also require a landholder to refrain from, control or refuse to permit, activities that may adversely affect the species, ecological communities, habitats or potential habitats covered by the agreement.”

The land surrounding the Nolans Project mine site is owned and managed by graziers, with some areas co-managed with Traditional Owners. Suitable Offset Mechanisms on private lands (such as grazing leases) proposed by SEWPaC (2012) include:

- should be legally secured for conservation purposes for at least the duration of the impact;
- the securing scheme should actively monitor for compliance, with covenant requirements enforced; and
- any change in legal status should require Ministerial or statutory approval.

Suitable Offset Mechanisms on Indigenous owned lands proposed by SEWPaC (2012) include:

- offsets having customary law protection with Traditional Owners holding a non-transferable interest in the land with a commitment to its long-term protective management; and
- offsets including a commitment from Traditional Owners to accept and manage the offset.

Whilst the primary consideration in determining suitable offsets would be delivering a conservation gain for the Black-footed Rock-wallaby and Great Desert Skink, the delivery of offsets that establish positive social or economic co-benefits would also be encouraged by the Commonwealth Minister. Examples of social or economic benefits relevant to Nolans Project might be:

- Offsets that contribute to an area recognised as important to increasing landscape connectivity, above and beyond what is required by the impacted protected matter; and
- Offsets that employ local Indigenous rangers to undertake management actions – grazing, fire and feral species management in surrounding area.

Offsets can be delivered by a range of mechanisms, including market-based mechanisms (e.g., land brokering services, biodiversity banking schemes) and contracting third party providers (e.g., rural landholders, private conservation organisations, indigenous corporations).

4. Future management and monitoring of offsets

A critical component of offsets would be management and monitoring undertaken into the future. Performance of offsets is reviewed as part of the monitoring, compliance and audit program for all proposals considered under the EPBC Act. Monitoring is essential to provide frequent, regular and scientifically robust feedback on the performance of the offsets (e.g. changes in numbers of Black-footed Rock-wallaby and Great Desert Skink relative to the effectiveness of a predator-control program, or changes in population size relative to fire and grazing management).

The information required as part of the monitoring would depend on the nature of the impact and the offset requirements and would be outlined in the project's Conditions of Approval. It may include flora and fauna survey data, rates of breeding success, and photo point images.

Arafura Resources would be required to provide information (e.g. annual reports) about the management of the offset to the department as part of the ongoing monitoring. Reports may be made publicly available.

5. References

DEWHA (Department of Environment, Water, Heritage and the Arts) 2009, Significant impact guidelines 1.1, Matters of National Environmental Significance. *Environment Protection and Biodiversity Conservation Act 1999*.

McAlpin, S. (2001). *A recovery plan for the Great Desert Skink (Egernia kintorei) 2001-2011*. Alice Springs: Arid Lands Environment Centre.

Pearson, D.J. (2013). *Recovery plan for five species of rock wallabies: Black-footed rock wallaby (Petrogale lateralis), Rothschild rock wallaby (P. rothschildi), Short-eared rock wallaby (P. brachyotis), Monjon (P. burbidgei) and Nabarlek (P. concinna) 2012-2022*. Department of Parks and Wildlife, Perth, WA.

SEWPaC (Department of Sustainability, Environment, Water, Population and Communities) 2012, Environmental Offsets Policy: *Environment Protection and Biodiversity Conservation Act 1999*.

Appendices

Appendix A - Requirements and definitions relevant to the EPBC Act

What is a significant impact?

According to the Significant Impact Guidelines for the EPBC Act (DEWHA 2009), a 'significant impact' is:

'an impact which is important, notable, or of consequence, having regard to its context or intensity. Whether or not an action is likely to have a significant impact depends upon the sensitivity, value, and quality of the environment which is impacted, and upon the intensity, duration, magnitude and geographic extent of the impacts. You should consider all of these factors when determining whether an action is likely to have a significant impact on matters of national environmental significance.'

Significant impact criteria for a Vulnerable species

An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:

- lead to a long-term decrease in the size of an important population of a species
- reduce the area of occupancy of an important population
- fragment an existing important population into two or more populations
- adversely affect habitat critical to the survival of a species
- disrupt the breeding cycle of an important population
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat
- introduce disease that may cause the species to decline, or
- interfere substantially with the recovery of the species.

What is a population of a species?

A 'population' of a species is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to:

- a geographically distinct regional population, or collection of local populations, or
- a population, or collection of local populations, that occurs within a particular bioregion.

What is an invasive species?

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

What is habitat critical to the survival of a species?

'Habitat critical to the survival of a species or ecological community' refers to areas that are necessary:

- for activities such as foraging, breeding, roosting, or dispersal
- for the long-term maintenance of the species or ecological community (including the maintenance of species essential to the survival of the species or ecological community, such as pollinators)
- to maintain genetic diversity and long term evolutionary development, or
- for the reintroduction of populations or recovery of the species or ecological community.

Such habitat may be, but is not limited to: habitat identified in a recovery plan for the species or ecological community as habitat critical for that species or ecological community; and/or habitat listed on the Register of Critical Habitat maintained by the minister under the EPBC Act.

GHD

57 Orange Avenue
Mildura, Victoria 3500

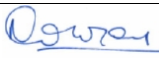
T: (03) 5018 5200 F: (03) 5018 5201 E: milduramail@ghd.com.au

© GHD 2016

This document is and shall remain the property of GHD. The document may only be used for the purpose for which it was commissioned and in accordance with the Terms of Engagement for the commission. Unauthorised use of this document in any form whatsoever is prohibited.

G:\43\22301\WP\603891.docx

Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	D. Eyles	A. Holmes		Nicole Conroy		16/02/2017

www.ghd.com

