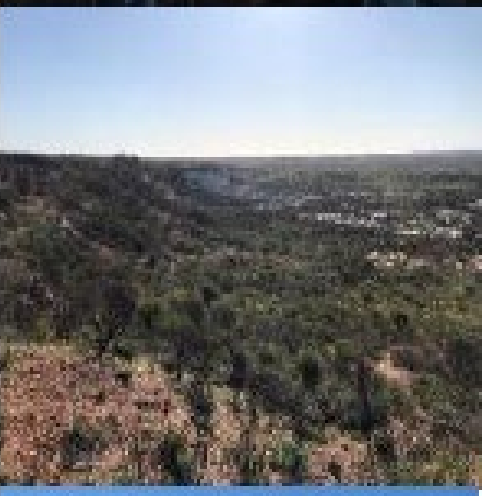

Australian Gas Infrastructure Group

WEST ERREGULLA PROCESSING PLANT AND PIPELINE

Rehabilitation and Offset Management Plan

E-PLN-044

Revision 8

May 2023

DOCUMENT CONTROL

Rev	Date	Description
0-5	March 2021 – July 2022	Internal review. Initial submission with ERD. Revised on feedback from regulators. Updated for acquisition location survey details and EPA feedback.
6	December 2022	Updated to indirect offset for Sandplain Duck Orchid, addition of *Lasiopetalum ogilvieanum* and *Banksia scabrella* and submission to EPA and EPBC with final location and tenure information.
7	March 2023	Updated on EPA feedback.
8	May 2023	Finalised on EPA feedback.

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Abbreviations

Abbreviation	Description
AGIO	AGI Operations Pty Ltd
BC Act	*Biodiversity Conservation Act 2016*
CEMP	Construction Environmental Management Plan
CHMP	Cultural Heritage Management Plan
CSSHZ	Conservation Significant Species Habitat Zone
DBCA	Department of Biodiversity, Conservation and Attractions
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DBNGP	Dampier to Bunbury Natural Gas Pipeline
DMIRS	Department of Mines, Industry Regulation and Safety
DWER	Department of Water and Environmental Regulation
EP Act	*Environmental Protection Act 1986*
EPA	Environmental Protection Authority (WA)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
MNES	Matters of National Environmental Significance
NVZ	Native Vegetation Zone
ROMP	Rehabilitation and Offset Management Plan
WA	Western Australia

1 Introduction

1.1 Project Summary

Australian Gas Infrastructure Operations (AGIO) Pty Ltd (the Proponent) propose to construct and operate a gas processing plant and pipeline near Dongara, Western Australia collectively referred to as the West Erregulla Gas Project (the Proposal) (Figure 1-1). The Proposal involves the processing of gas from upstream wells (third party) and transport of the gas to the Dampier to Bunbury Natural Gas Pipeline (DBNGP) and includes:

- A gas processing facility (referred to by the Proponent as the WEG), with a nominal design flow capacity of 87 terajoules per day (TJ/d).
- A 16.5 km interconnecting buried gas pipeline between the gas processing facility and the DBNGP tie-in point. The pipeline will be installed at a shallow depth and above the water table.
- Supporting infrastructure including but not limited to a custody transfer metering facility located at the DBNGP tie-in point, a pig launcher station, power generation, flare system, incinerator, fire water system, water treatment package, back-up diesel system, communications and access tracks.

A Development Envelope of 213 ha was surveyed to ensure siting to minimise environmental impacts. Total proposed disturbance is 90 hectares (ha), referred to as the 'Disturbance Footprint' (Figure 1-2). Approximately 41.5 ha (46%) of the Disturbance Footprint is intended to be rehabilitation upon completion of construction.

Construction is expected to commence in late 2023 and be completed by late 2024.

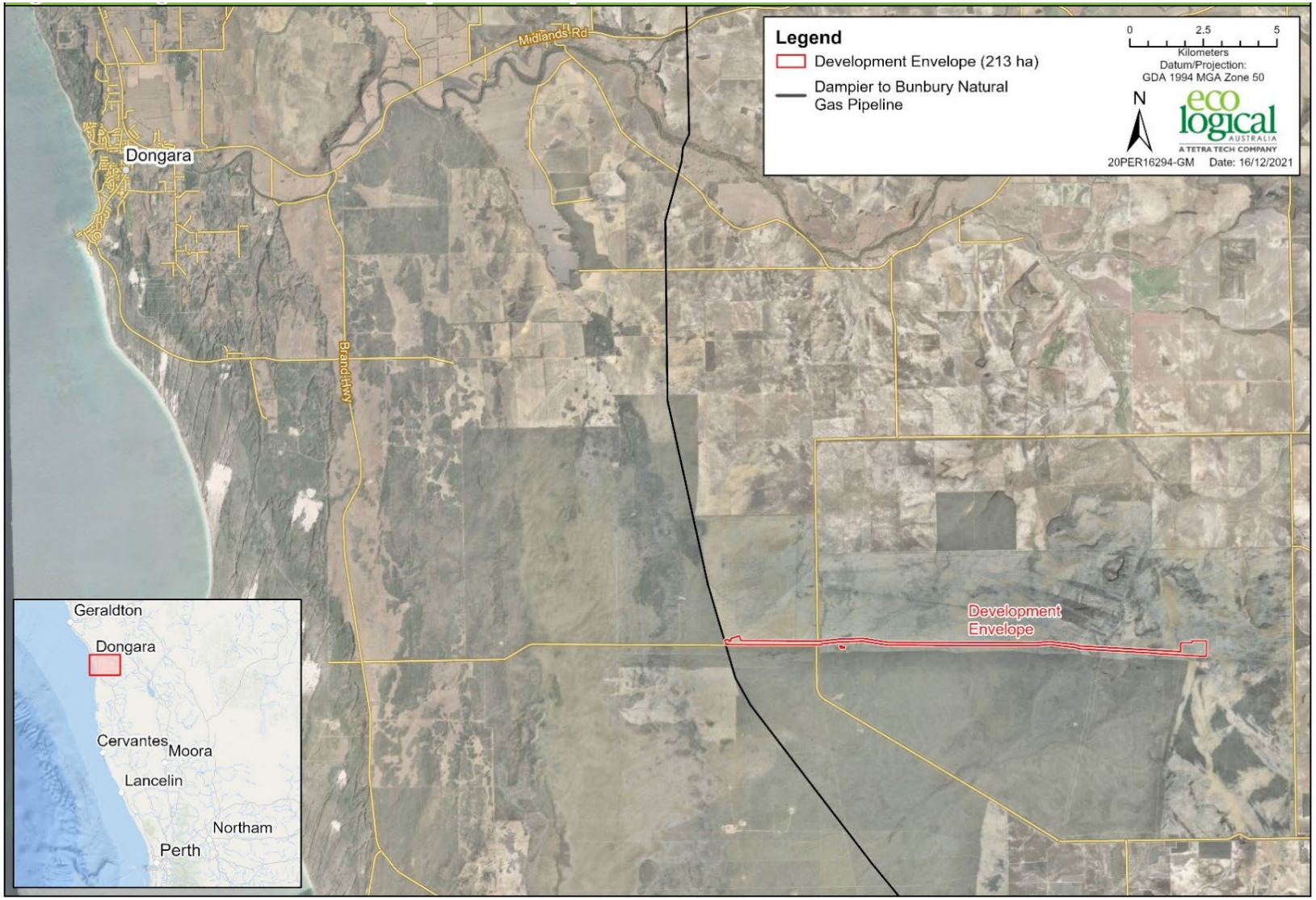

Figure 1-1 Regional context and Proposal location

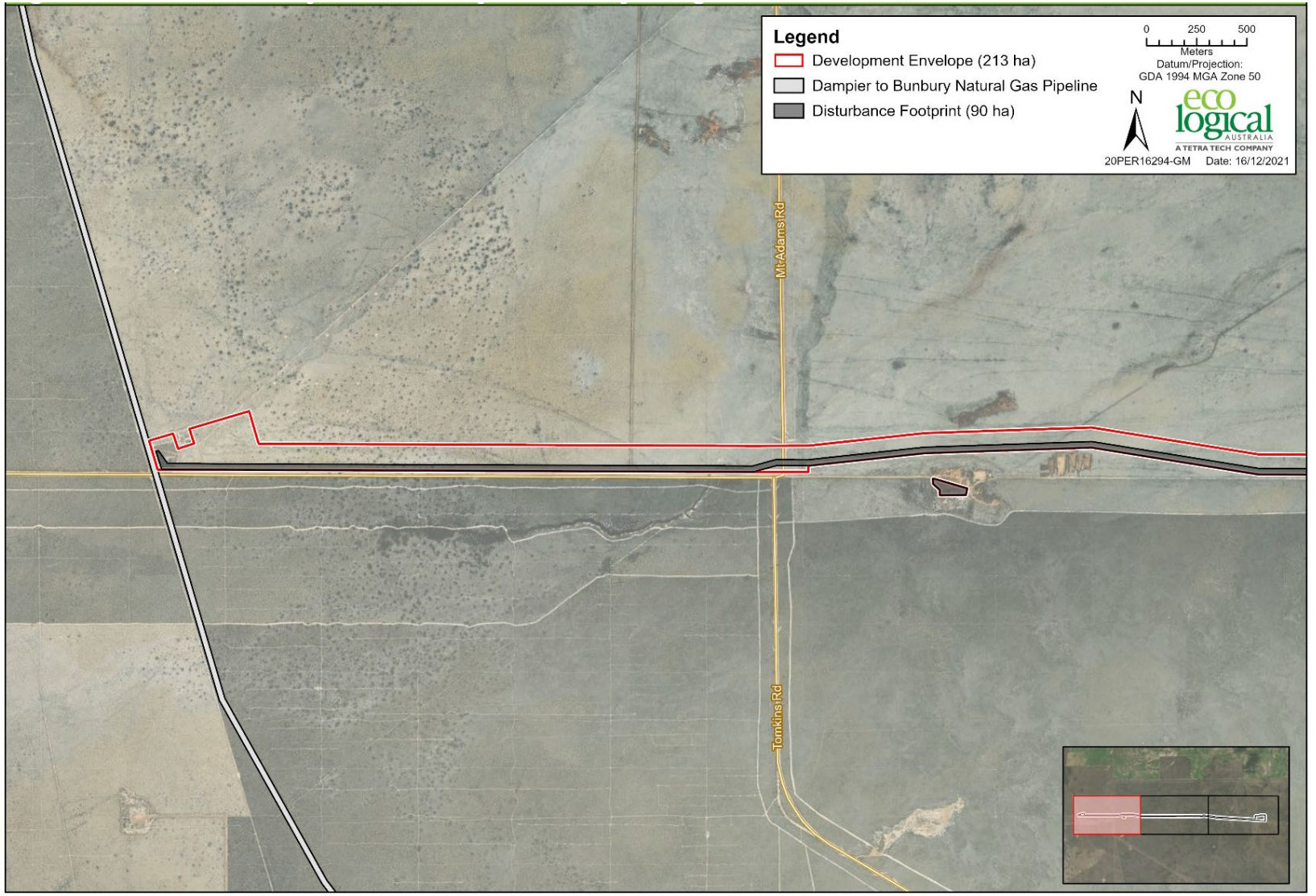

Figure 1-2 Disturbance Footprint and Development Envelope (1/3)

Figure 1-2 Disturbance Footprint and Development Envelope (2/3)

Figure 1-2 Disturbance Footprint and Development Envelope (3/3)

1.2 Purpose and Scope

The Proposal has been referred under Western Australia's *Environmental Protection Act 1986* (EP Act) and the Commonwealth's *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The Proposal will be assessed on Referral Information with additional information required under the EP Act. The Department of Climate Change, Energy, the Environment and Water (DCCEEW) has determined the Proposal to be a Controlled Action to be assessed on Preliminary Documentation under the EPBC Act (ref. EPBC 2021/8907).

This Rehabilitation and Offset Management Plan (ROMP) has been prepared in accordance with both State and Commonwealth offset policy and guidance.

1.2.1 State Offset Requirements

The EPA's environmental objective for proposals that may require Environmental Offsets is:

'To counterbalance any significant residual environmental impacts and/or uncertainty through the application of offsets' (EPA 2014).

The following State policies and guidance are relevant to the offsets:

- WA Environmental Offsets Policy (EPA 2011)
- Environmental Protection Bulletin Number 1: Environmental Offsets
- WA Environmental Offsets Guidelines (GoWA 2014)
- Environmental Impact Assessment (Part IV Divisions 1 and 2) Procedures Manual (EPA 2021).

The Proponent has considered the six principles outlined in the WA Environmental Offsets Policy (EPA 2011) and the WA Environmental Offsets Guidelines (EPA 2014), as detailed in Table 1-1. It is considered that offsets are appropriate for this Project as a result of the significant residual impacts to the Carnaby's Cockatoo, *Paracaleana dixonii* (Sandplain Duck Orchid), *Lasiopetalum ogilvieanum* and *Banksia scabrella*. The proposed offset site has been sourced in consultation with the Department of Biodiversity Conservation and Attractions (DBCA) to ensure that it is focused on longer term strategic outcomes.

Table 1-1: Principles for the use of Environmental Offsets

WA Offset Principles	Assessment of Proposed Offsets
Environmental offsets will only be considered after avoidance and mitigation options have been pursued	As detailed within the ERD, the mitigation hierarchy has been applied to the Project to first seek to avoid and minimise the impact to ecological values. This has included selecting the route alignment to reduce the impact to identified threatened species and ensuring the Disturbance Footprint is the minimum width required for construction. A number of additional mitigation measures will be implemented through the Construction Environmental Management Plan to further minimise the impact to ecological values. However, after the implementation of avoidance and mitigation measures it has been assessed that there is a significant residual impact to Carnaby's Cockatoo, Sandplain Duck Orchid, *Lasiopetalum ogilvieanum* and *Banksia scabrella*.

Environmental offsets are not appropriate for all projects	It is acknowledged that offsets are not appropriate for all projects. Offsets are considered appropriate for this project as a result of the residual impact to the species listed above.
Environmental offsets will be cost cost-effective, as well as relevant and proportionate to the significance of the environmental value being impacted	The proposed rehabilitation offset, and acquisition site offset will be efficiently managed in a transparent manner by the Proponent in accordance with this ROMP. The offsets proposed are considered appropriate and are consistent with the WA Environmental Offsets Policy, providing greater than 100% of the impact offset as identified through the offset calculators. The offset package proposed is considered proportionate to the size and scale of the residual impacts to Carnaby's Cockatoo, Sandplain Duck Orchid, *Lasiopetalum ogilvieanum* and *Banksia scabrella*. The offset site provides a known location of three out of the four key species as well as supporting a high volume of vegetation associations for all conservation species disturbed by the proposal. The size is proportionate to the requirements outlined (as per calculators) as well being unfeasible to deliver a separate offset for *Lasiopetalum ogilvieanum.* Management actions, including presence of *Lasiopetalum ogilvieanum* in the offset location. The location being directly adjacent and as part of same vegetation system allows for ongoing natural processes to improve the site in regard to *Lasiopetalum ogilvieanum.*
Environmental offsets will be based on sound environmental information and knowledge	The proposed acquisition offset has been sourced in consultation with DBCA, utilising the Department's knowledge of land parcels that will most effectively mitigate the loss of habitat for these species associated with the Project. The acquisition offset site has been assessed by Mattiske (2021), who have a sound knowledge of ecological assessments.
Environmental offsets will be applied within a framework of adaptive management	This ROMP incorporates requirements for adaptive management where set targets are not met in a timely manner.
Environmental offsets will be focused on longer term strategic outcomes	The acquisition offset has been sourced in consultation with DBCA to ensure that the site meets longer term strategic outcomes.

1.2.2 Commonwealth Offset Requirements

The EPBC Act Environmental Offsets Policy (DSEWPaC 2012a) outlines the Commonwealth government's approach to the use of offsets under the EPBC Act.

The Policy defines offsets as *'measures that compensate the residual adverse impacts of an action on the environment'*. The policy states that avoidance and mitigation measures must be the primary strategy to manage significant impacts and the offsets do not reduce likely impacts but rather compensate for residual significant impacts.

The following policies and guidance are relevant to the offsets:

- EBC Act Environmental Offsets Policy (DSEWPaC 2012a)

- Offset Assessment Guide (DSEWPaC 2012b)
- Offset Calculator Guidelines (DSEWPaC 2012c)

Table 1-2 demonstrates that the proposed offsets are consistent with the offset principles as outlined within the EPBC Act Offsets Policy (DSEWPaC 2012a).

Table 1-2: Assessment against the EPBC Offset Principles

EPBC Offset Principles	Assessment of Proposed Offsets
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	The proposed offset package will result in an improved overall conservation outcome, ensuring retention and enhancement of habitat for the identified species.
Suitable offsets must be built around direct offsets but may include other compensatory measures	The offset package proposed entirely consists of both direct and indirect offsets that will improve the protection, management, and long-term viability of the identified species.
Suitable offsets must be in proportion to the level of statutory protection that applies to the protected matter	The offsets proposed are considered appropriate and are consistent with the EPBC Environmental Offsets Policy, providing greater than 100% of the impact offset as identified through the offset calculators.
Suitable offsets must be of a size and scale proportionate to the residual impacts on the protected matter	The offset package proposed is considered proportionate to the size and scale of the residual impacts to the identified species.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding	The risk of the offset option not fulfilling the aims for which it is designed is considered to be low. The Development Envelope will be the subject of ongoing management by the Proponent in accordance with the CEMP and this ROMP. The Proponent has a proven track record of environmental management and more specifically rehabilitation success in arid environments. The habitat acquired and ceded to conservation estate will be managed in perpetuity under a conservation covenant.
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)	The proposed offsets package is additional to what is already required. EPBC requires offset for two species specifically covered in this ROMP (Carnaby's Cockatoo and Sandplain Duck Orchid) which is also part of the WA EPA offset requirements. This offset package is additional to existing planning and approval obligations, but the offset package recognises that this is the same offset at both State and Commonwealth level.

Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable	The proposed rehabilitation and acquisition offsets will be efficiently managed in a transparent manner by the Proponent in accordance with this ROMP.
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced.	Performance measures for the improvement of the rehabilitation offset are detailed in this ROMP and are readily measurable through ongoing monitoring and reporting in terms of improvements being undertaken.

1.3 Residual environmental impacts

The residual impacts of the Proposal have been identified as follows:

- Loss of 37.7 ha of habitat for the Carnaby's Cockatoo (*Zanda latirostris*) – Endangered (EPBC Act and BC Act).
- Loss of 79.7 ha of habitat for the Sandplain Duck Orchid (*Paracaleana dixonii*) - Endangered (EPBC Act), Vulnerable (Biodiversity Conservation Act 2016 (BC Act))
- Loss of 73.8 ha of habitat for *Lasiopetalum ogilvieanum* (P1)
- Loss of 82.7 ha of habitat for *Banksia scabrella* (P4)

A summary of the habitat requirements of these species of conservation significance is provided below.

1.3.1 Paracaleana dixonii

Paracaleana dixonii occurs in deep sand in open areas beneath dense tall shrubland with scattered emergent banksias, or in shallow sand over laterite in heathland (Hopper & Brown 2006).

The species is generally known from small populations of scattered individuals in white and grey sandy areas with lateritic gravel or laterite near the surface. The assessment of the broader West Erregulla study area identified 263 individuals across 30 sub-populations in 2011-2012 (Woodman Environmental Consulting, 2013). The species was recorded across a variety of vegetation types but was predominantly recorded within the following habitat types:

- Low open woodland of Pricklybark (*Eucalyptus todtiana*) over mid to low shrubland of mixed species on grey or brown sand on lower and mid slopes
- Mid sparse to open shrubland of mixed species including *Calothamnus quadrifidus* subsp. *angustifolius*, *Grevillea biformis* subsp. *biformis* and Coast Banksia (*Banksia attenuata*) over low shrubland and sedgeland of mixed species on yellow-brown or occasionally grey sand on slopes and valley floors
- Occasional mid sparse to open shrubland of *Allocasuarina campestris* and *Grevillea biformis* subsp. *biformis* over low shrubland and sedgeland on grey or brown sand or sandy loam on mid to upper slopes.

Approximately 191.2 ha of potential habitat for *Paracaleana dixonii* has been mapped within the Development Envelope, of which up to 79.7 ha will be impacted by the Proposal.

1.3.2 Carnaby's Cockatoo

Carnaby's Cockatoo is predominantly restricted to areas of remnant native woodland with an understory dominated by proteaceous species such as *Banksia*, *Hakea* and *Grevillea* (DPaW 2013). Breeding occurs mainly in the Wheatbelt and extends to Hopetoun and Ravensthorpe (DoEE 2017). The Development Envelope does not occur within the species breeding range but has been assessed as occurring within an area that supports low quality foraging habitat for the species. Low quality foraging habitat is defined as that which provides suitable foraging species (*Banksia* spp. and *Hakea* spp.) at a low density (<10%).

Within the Development Envelope potential habitat for the Carnaby's Cockatoo was identified as *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland over shrubs and sedgeland on sandy plains (ELA, 2021). Approximately 95.2 ha of low-quality foraging habitat for Carnaby's Cockatoo has been mapped within the Development Envelope, of which up to 37.7 ha will be impacted by the Proposal.

1.3.3 *Lasiopetalum ogilvieanum*

Lasiopetalum ogilvieanum mainly occurs on white/grey or yellow sand, stony loam on undulating plains or lateritic rises. The species was originally known from 21 records across a range of 85km north and south of Dongara and flowers between July and October. There were 6 populations and 100 individuals identified in the Development Envelope (ELA 2021).

Given the loss of *Lasiopetalum ogilvieanum* (P1) is greater than 50% within the Development Envelope, specific rehabilitation criteria have been set for this species to ensure it continues to persist in the local area. This genus is known to be able to be propagated from seed (Wildflower Society of Western Australia, 2007). The species is also known from the broader local area with 113 individuals from 26 populations mapped within the Woodman (2013) survey. Therefore, the proposal will result in a reduction of 27.10% of number of individuals of this species within the broader local area.

The assessment of the Development Envelope indicated the presence in three key vegetation communities covering approximately 76% of the area as suitable habitat including:

- **AcEbH:** *Allocasuarina campestris* tall sparse shrubland over E*remaea beaufortioides, Calothamnus quadrifidus subsp. angustifolius, Isopogon tridens* mid sparse shrubland over *Hibbertia hypericoides, Melaleuca leuropoma* low open shrubland and *Ecdeiocolea monostachya* low open sedgeland.
- **ETAhHh:** *Eucalyptus todtiana* mid open woodland over *Allocasuarina humilis, Banksia scabrella (P4), Calothamnus sanguineus* mid open shrubland over *Hibbertia hypericoides, Melaleuca leuropoma* low open shrubland and *Caustis dioica* low open sedgeland.
- **AcDdMI:** *Allocasuarina campestris* tall, isolated shrubs over *Daviesia divaricata, Conospermum boreale, Beaufortia elegans* mid open shrubland over *Melaleuca leuropoma, Hibbertia hypericoides* low open shrub over *Ecdeiocolea monostachya* low open sedgeland.

Approximately 163.1 ha of potential habitat for *Lasiopetalum ogilvieanum* been mapped within the Development Envelope, of which up to 73.8 ha will be impacted by the Proposal. Noting that approximately 30 ha of the pipeline disturbance area will be rehabilitated post construction.

1.3.4 *Banksia scabrella*

Banksia scabrella is known from 53 records over a range of 100km from Geraldton to Dongara. It occurs on white, grey, or yellow sand sometimes with lateritic gravel, on sandplains and lateritic ridges.

B. scabrella was identified to occur in five of the six vegetation communities identified in the development envelope covering ~85% of the area. There were 2 populations identified in the development envelope including 10,776 individuals with over 34,000 in the broader local area. Impacts in the development footprint is proposed at 5,015 individuals.

Vegetation communities includes those for *Lasiopetalum ogilvieanum* listed above as well as:

- **AcAhGp:** *Allocasuarina campestris* tall sparse shrubland over *Allocasuarina humilis*, *Hakea auriculata*, *Petrophile shuttleworthiana* mid open shrubland over *Gastrolobium plicatum* low open shrubland and *Ecdeiocolea monostachya*, *Schoenus armeria* low open sedgeland.
- **BpDdHh**: *Banksia prionotes* mid open woodland over *Daviesia divaricata*, *Conospermum boreale*, *Allocasuarina humilis* mid open shrubland over *Hibbertia hypericoides* low open shrubland and *Ecdeiocolea monostachya*, *Mesomelaena pseudostygia* low open sedgeland.

Approximately 180.6 ha of potential habitat for *Banksia scabrella* has been mapped within the Development Envelope, of which up to 82.7 ha will be impacted by this Proposal. Noting that approximately 31 ha of the pipeline disturbance area will be rehabilitated post construction.

1.3.5 Other priority species

The combination of vegetation communities listed for the species above covers the full disturbance footprint of the proposal. As such this ROMP also provides an offset for the other priority species identified to be impacted.

This includes:

- DBCA Priority 1 (P1)
  - *Micromyrtus rogeri*
  - *Lasiopetalum ogilvieanum*
- DBCA Priority 3 (P3)
  - *Guichenotia alba*
  - *Mesomelaena stygia subsp. deflexa*
  - *Stylidium drummondianum*
  - *Hemiandra sp. Enneaba*
  - *Banksia fraseri var. creba*
- DBCA Priority 4 (P4)
  - *Banksia scabrella*
  - *Eucalyptus macrocarpa subsp. elachantha*
  - *Stawellia dimorphantha*

2. Rehabilitation and Offset Strategy

2.1 Objective

The Proponent intends to counterbalance the residual impacts of the Proposal through implementation of a rehabilitation and offset package that combines rehabilitation within the Disturbance Footprint; acquisition of land that supports suitable habitat for *Paracaleana dixonii, Lasiopetalum ogilvieanum, Banksia scabrella* and Carnaby's Cockatoo; and further research (indirect offset) into *Paracaleana dixonii*.

2.2 Proposed Rehabilitation and Offsets Package

The following rehabilitation and offsets package has been prepared in accordance with the EPBC Act Environmental Offset Policy (DSEWPaC 2012a), the WA Government's Environmental Offset Policy (GoWA 2011), and the WA Offset Guidelines (GoWA 2014). As such, the proposed offsets are proportionate to the level of impact and significance of the environmental impact.

Environmental offsets proposed for *Paracaleana dixonii* are as follows:

- Rehabilitation of 30 ha within the Disturbance Footprint with native vegetation species suitable for providing *Paracaleana dixonii* habitat. Noting that this is not counted towards overall offset figures and not included in the EPBC Calculators.
- Indirect research program funded by the proponent based on the research priorities outlines in the Conservation Advice for the species.
- Acquisition of 153 ha of potential *Paracaleana dixonii* habitat at an off-site location. Land containing this habitat will be under a conservation covenant.

Environmental offsets proposed for Carnaby's Cockatoos are as follows:

- Rehabilitation of 12 ha within the Disturbance Footprint with species suitable for Carnaby's Cockatoo foraging.
- Acquisition of 65 ha of comparable low quality foraging habitat for Carnaby's Cockatoo at an off-site location. Land containing this habitat will be under a conservation covenant.

Environmental offsets proposed for *Lasiopetalum ogilvieanum* are as follows:

- Rehabilitation of 30 ha within the Disturbance Footprint with native vegetation species suitable for providing *Lasiopetalum ogilvieanum* habitat.
- Acquisition of 135 ha of potential *Lasiopetalum ogilvieanum* habitat at an off-site location. Land containing this habitat will be under a conservation covenant.

Environmental offsets proposed for *Banksia Scabrella* are as follows:

- Rehabilitation of 30 ha within the Disturbance Footprint with native vegetation species suitable for providing *Banksia Scabrella* habitat.
- Acquisition of 153 ha of potential *Banksia Scabrella* habitat at an off-site location. Land containing this habitat will be under a conservation covenant.

Further details on the proposed rehabilitation, land acquisition and indirect research are provided in Sections 3 to 5.

3. Rehabilitation

It is noted that while rehabilitation is an important part of mitigating species impacts and encouraging re-growth, the impacts of rehabilitation are not included in the EPBC calculators for *Paracaleana dixonii* and Carnaby's Cockatoo as part of the offset strategy with the key focus being the indirect research and land acquisition.

3.1 Environmental management objectives

Rehabilitation will be undertaken in all areas cleared for construction purposes that are not required for operational use. The Project will require clearing of 90 ha of native vegetation. Post-construction, the majority of the Disturbance Footprint will be rehabilitated. Effective rehabilitation will manage potential impacts from:

- Direct loss through clearing of native vegetation
- Direct loss of fauna habitat from clearing
- Injury or mortality of individuals from vehicle or machinery interaction
- Introduction and/or spread of weed species as a result of disturbance and vehicle/ machinery movements
- Fire events.

Implementation of the Construction Environmental Management Plan (CEMP) will address specific management requirements relevant to construction and operation in terms of flora and vegetation, weeds, fauna, waste, hazardous material management and fire. There are some factors beyond the control of the Proponent that could affect the achievement of rehabilitation outcomes, such as climate change, occurrence of rainfall (drought or flooding) and fire. The factors that represent a risk to rehabilitation success are further addressed below.

Monitoring at both rehabilitation and control sites will be undertaken to determine progress towards achievement of objectives and management targets, and to identify where contingency actions need to be implemented to manage any risks to the rehabilitation outcomes (see Sections 6.1 and 7.2).

3.2 Disturbance and rehabilitation

The majority of the pipeline corridor (excluding permanent facilities and access tracks) will be rehabilitated as outlined in Table 3-1. This area will be allowed to return to native vegetation and terrestrial fauna habitat, with the overarching aim of restoring terrestrial ecosystems across the Development Envelope.

The 6 m restricted rehabilitation includes the area directly above the pipeline which requires clearing for line of sight of pipeline markers under Australian Standard 2885 (AS2885) and the DMIRS approved safety case. In this area, rehabilitation is encouraged, and full reinstatement will occur, however every 3 to 5 years vegetation maintenance occurs to ensure that the requirements of AS2885 are met which means ensuring the height of vegetation in managed and large trees that could impact the pipeline integrity are pruned or removed depending on distance from the pipeline.

Table 3-1: Disturbance Footprint and Rehabilitation

Item	Disturbance Footprint	Proposed Rehabilitation
Gas processing plant: Gas plant Evaporation pond Evaporation pond piping Potential construction camp Connecting track to wellheads	42 ha	5 ha
Gas pipeline: 30 m wide construction right of way: 6 m restricted rehabilitation over pipeline (no trees) 3 m permanent access track 21 m temporary disturbance for construction only	43 ha*	~38.7 ha including restricted area. ~30.1 ha full rehabilitation
Support infrastructure: DBNGP tie in facility Access tracks (construction only) Ancillary works (bore access, permanent access tracks)	 1ha 1ha 3 ha	 0.5 ha 1 ha 0 ha
TOTAL	**90 ha**	**45.2 ha (including restricted area)** **36.6 ha full rehabilitation**

* Note: Some of the clearing width for the 16.5 km pipeline is within the processing plant and DBNGP tie in facility footprint. Therefore, the clearing for the gas pipeline only refers to clearing outside of these infrastructure areas.

3.3 Surveys and study findings

A number of studies have been undertaken across the Development Envelope to assess the vegetation and fauna baseline conditions. These studies and results are discussed in Table 3-2.

Table 3-2 Overview of studies undertaken in proximity to the Development Envelope

Reference	Survey type and location	Conservation significant species of communities
West Erregulla targeted threatened flora survey (Mattiske 2021)	Targeted flora survey for *Paracaleana dixonii*	One individual of the targeted threatened taxa *Paracaleana dixonii* Two additional priority species identified in area not previously identified. *Hemiandra sp. Eneabba* (P3) – 6 individuals *Banksia fraserii var. creba* (P3) – 43 individuals

West Erregulla Pipeline Flora and Fauna survey (Eco Logical Australia 2020a).	Detailed and Targeted flora survey and vegetation condition assessment, Basic fauna survey, Targeted Black Cockatoo habitat assessment and Targeted Malleefowl survey (of the Development Envelope).	No individuals of the targeted threatened taxa *Paracaleana dixonii* No individuals of the targeted threatened species Carnaby's Cockatoo (*Calyptorhynchus latirostris*) and Malleefowl (*Leipoa ocellata)* recorded. No Threatened Ecological Communities (TECs) were recorded.
Review of key potential flora, vegetation and fauna values on the proposed pipeline for Strike Energy near Dongara (Mattiske 2020)	Desktop assessment of the potential flora, vegetation and fauna values present (within the ELA 2020a survey area).	13 threatened flora species listed under the EPBC Act have the potential to occur. 4 TECs have the potential to occur. 11 threatened fauna species listed under the EPBC Act have the potential to occur.
West Erregulla targeted threatened flora survey (Ecologia 2018)	Targeted threatened flora survey (within the current survey area)	No individuals of the targeted threatened taxa *Thelymitra stellata, Paracaleana dixonii* and *Eucalyptus crispata*. No TECs were recorded.
West Erregulla Project Flora and Vegetation Assessment (Woodman 2013)	Detailed flora and vegetation survey (within the current survey area)	Threatened flora: *Thelymitra stellata, Paracaleana dixonii, Eucalyptus crispata.* No TECs were recorded.

3.4 Key assumptions and uncertainties

Factors that represent risk to the success of the rehabilitation are described below. The rehabilitation objectives, management targets and actions (Table 3-4), and corrective actions (Table 7-1) have been designed to try to minimise these risks wherever possible.

- **Increase in weed cover and diversity:** weeds can be introduced and/or spread to the Development Envelope via vehicles and equipment. New species can be introduced, or existing infestations can be spread into new areas. Weeds could prevent or delay the re-establishment of native species in rehabilitation areas.
- **Extreme weather**: extreme or unexpected weather events, such as flooding or drought, could wash away topsoil, modify landforms through erosion, or prevent seedling germination due to lack of rainfall. These negative impacts could prevent successful rehabilitation from occurring.
- **Fire:** wildfires, particularly unusually hot or out of control fires, have the potential to burn new growth, thereby preventing successful rehabilitation.
- **Introduced fauna:** introduced herbivores, such as cattle, rabbits and camels, could graze on new growth, thereby limiting the potential for regeneration of native vegetation. Introduced predators, such as cats and foxes, show preference for open areas for hunting, which could negatively impact on native fauna attempting to recolonise rehabilitated areas.

The Proponent is ultimately responsible for successful rehabilitation of the Proposal to meet the specific completion criteria outlined in this ROMP; however, there are actions that will be implemented by third parties where relevant (e.g. the Construction Contractor will implement the majority of actions based on a standard pipeline reinstatement and rehabilitation approach).

3.5 Rehabilitative processes and planning

The crucial first step in ensuring successful rehabilitation of the Proposal is in the design phase. This Proposal has been designed to enable micro-siting before construction to avoid and minimise impacts to sensitive environmental values including low quality Carnaby's Cockatoo foraging habitat. The alignment does not intersect any sensitive values, including established trees, sensitive watercourses or heritage locations; however, if during pre-clearance surveys or through cultural monitoring during construction these sites are encountered, the Proponent will implement requirements under the CEMP to minimise and avoid impact.

This design phase has been informed by ecological surveys to determine the vegetation and fauna habitats that occur and any specific features that are relevant (e.g. watercourses, rocks or logs for habitat complexity). A range of construction and operational methods and management measures have been identified in the CEMP and these will contribute to the successful rehabilitation of the pipeline corridor.

3.5.1 Reinstatement and rehabilitation

Reinstatement is the process which occurs post-construction and involves removing temporary infrastructure and re-installing the pre-existing landforms and soil profiles, with rehabilitation taking this process further and replacing disturbed vegetation over the rehabilitation area.

While reinstatement and rehabilitation are staged as part of the construction process, the method of reinstatement and rehabilitation is structured from the early design and planning phases. Initial soil stripping and reinstatement works aim to preserve the existing seed bank and utilise this as the basis for rehabilitation. This process has been successful in previous projects.

Once construction activities are predominantly complete in a section of the pipeline alignment, reinstatement and rehabilitation can commence. These activities will occur progressively to limit the time between removal of vegetation and re-establishment. The Disturbance Footprint will be re-contoured to match the surrounding landforms and erosion controls constructed where necessary. Separately stockpiled topsoil will then be re-spread evenly across the Disturbance Footprint and any stockpiled vegetation placed across the Disturbance Footprint to assist in soil retention, provision of seed stock and fauna shelter. In the initial stripping works, topsoil is targeted to maintain biological activity and reduce stockpile time. This includes height restriction (<2m), drainage and gaps to allow air flow and minimal handling of soil. Soil stripping and stockpiling is determined by the specific of the site including topsoil volume and depth, soil condition during removal (preferably slightly moist) and the use of appropriate machinery. Poorer quality topsoil (i.e. rock dominated) shall be stockpiled separately where required to act as a sub base prior to final topsoil covering. Stockpiles are sited to minimise interaction with construction vehicles, minimise erosion and sediment generation and targeted for reinstatement as soon as possible. The CEMP outlines the process for soil removal (stripping) of topsoil (to a maximum of 20 cm) and subsoil as well as trench excavation.

Long term soil stockpiles (plant location) will be monitored and actively managed to maintain floristic diversity and viability of the topsoil as a resource. Subsoil and vegetation stockpiles will be monitored for degradation and potential for use in future years. This includes erosion controls, prevention of sedimentation and ensuring drainage. Long term topsoil shall be stored within the fenced compound to reduce impacts from grazing and burrowing animals.

Further rehabilitation works, such as reseeding or revegetation (using appropriate species) may be undertaken to restore vegetation cover in areas that do not meet the rehabilitation criteria. Rehabilitation objectives and targets and corrective actions are set out in Sections 4.7 and 7.2 respectively.

The Proponent has conducted and successfully completed reinstatement and rehabilitation works on over 3,000 km of gas transmission pipelines (this is outlined further in Section 3.6). Rehabilitation will be consistent with this standard process, with potential for targeted management actions to be implemented, in particular, rehabilitation zones as relevant (see Section 3.5.2).

3.5.2 Seed collection

To facilitate management actions that may require reseeding, seed will be collected from within the development envelope (including the disturbance footprint) prior to ground disturbing activities. Calendars providing indicative timing, by species, shall be generated to assist and specialized consultants shall be used for the design and implementation of the seed collection program. Seed can be either used directly for rehabilitation works (immediately post construction) as part of a seed bank creation or stored in a designated seed storage facility prior to its eventual use for revegetation. Seed storage focuses on a cool, dry area to assist in maintaining seed quality. There will be targeted seed collection of priority species (including *P.dixonii*) to ensure these species are available for reseeding or propagation.

Seed quality parameters of viability, germinability and purity will be assessed while the seed is in storage (prior to use). Seed quality assessment provides an indicator of a species' potential regenerative capability. A mix of priority and native species seed shall be used in reseeding programs to both propagate the naturally occurring system but also improve potential for priority species improvements in populations.

Seed collection shall be authorised by the regulator as required for the activity and volume and conducted by licensed personnel. Seed collection and storage shall be in line with DMIRS *Guidelines for Preparing Mine Closure Plans* (DMIRS 2015) Section 3 (xvi).

Additional seed collection/s may occur at a later date (post construction) dependent on the success of the rehabilitation and offset site as the majority of the species impacted will still be present in the development envelope. Seed collection records (including GIS information) shall be utilised to confirm provenance of seed and assist in seeding sites over the length of the pipeline i.e. closest seed collection used in closest area to maintain local communities and habitats.

The offset site may also be seeded to introduce priority species such as *Lasiopetalum ogilvieanum* to the site to assist in propagation.

3.5.3 Rehabilitation zones

Three distinct rehabilitation zones have been defined based on ecological survey work undertaken to date and the presence of MNES habitat. They include the following:

- Sandplain duck orchid potential vegetation habitat (which includes other priority species)
- Carnaby's cockatoo potential foraging habitat.
- Other priority flora species potential vegetation habitat

These zones are shown in Figure 3-1 and fully described in Table 3-3.

Table 3-3: Primary rehabilitation zones

Rehabilitation categories	Descriptions	Extent within the 90 ha Disturbance Footprint (ha)	Approximate extent to be rehabilitated within the Disturbance Footprint (ha)
Carnaby's Cockatoo potential foraging habitat	Preliminary mapping includes *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland over shrubs and sedgeland on sandy plains.	37.7	12 ha
Sandplain Duck Orchid potential habitat	Sandplain Duck Orchid potential habitat include vegetation communities EtAhHh, AcEbHh, EtBaHh and AcDdMI.	79.7	30 ha
Other priority species including *Lasiopetalum ogilvieanum* and *Banksia scabrella*	Potential habitat includes vegetation communities: ACDdMI, AcEbHh, EtAhHh and AcDdMI, AcEbHh, EtAhHh, AcAhGp and BpDdHh.	82.7	31 ha

This ROMP is intended to be adaptive, such that new information about conservation significant species habitats can be taken into account in refining rehabilitation zone mapping. If a species is considered unlikely to occur in a particular area based on further information, that area will no longer be mapped as habitat for that conservation significant species. If no conservation significant species are considered to have potential habitat in an area, then the area would revert to native vegetation only. Conversely, if further information suggests that an area is potential or actual conservation significant species habitat, then mapping will be updated accordingly.

Initial habitat mapping has been completed based on reconnaissance field surveys conducted in late 2020 and reviewed against 2021 surveys. Rehabilitation zones may also be updated during trenching, for example if direct evidence of conservation significant species presence is detected in an area previously not considered potential conservation significant species habitat.

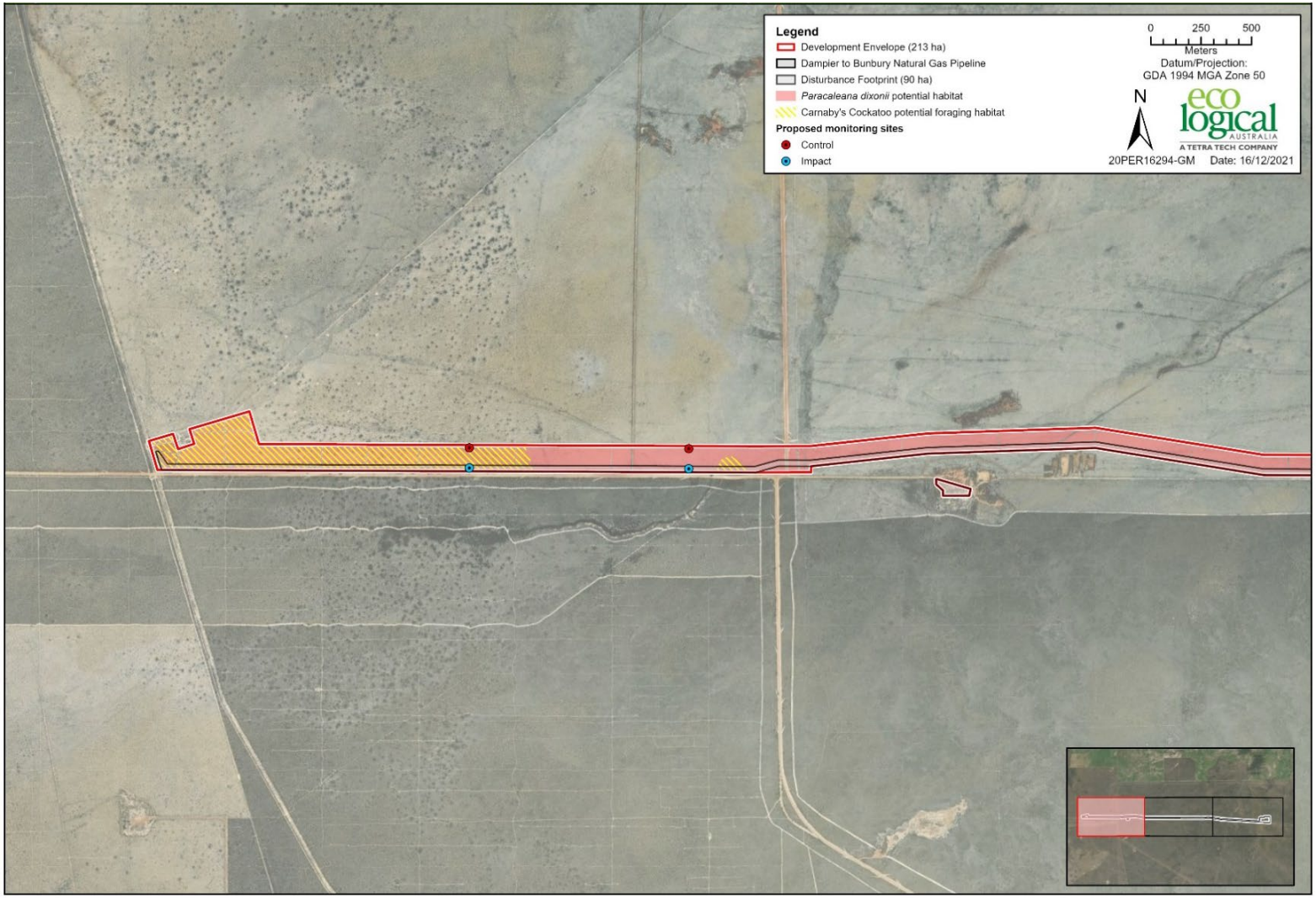

Figure 3-1 Rehabilitation zones within the Development Envelope (1/3)

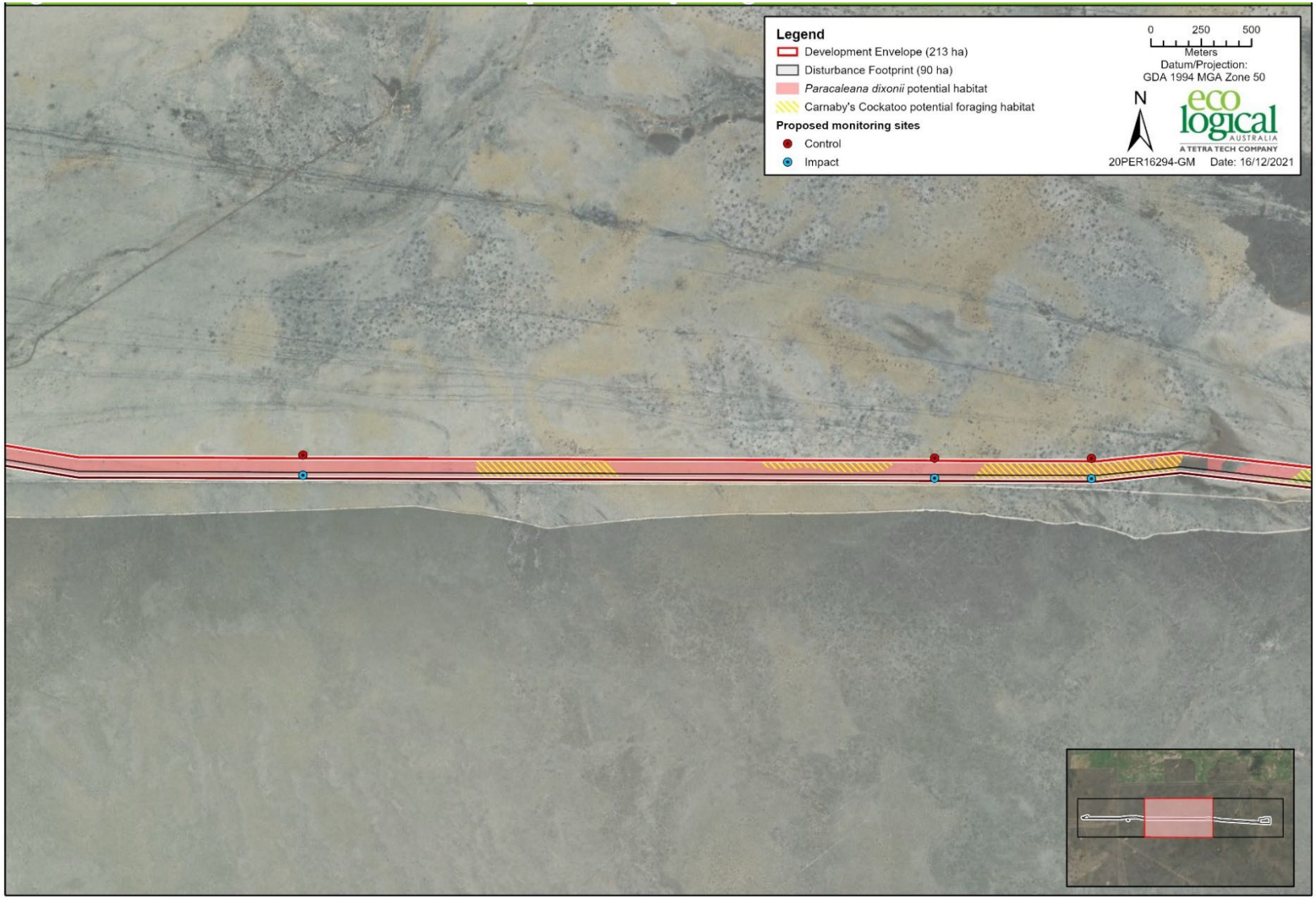

Figure 4-1 Rehabilitation zones within the Development Envelope (2/3)

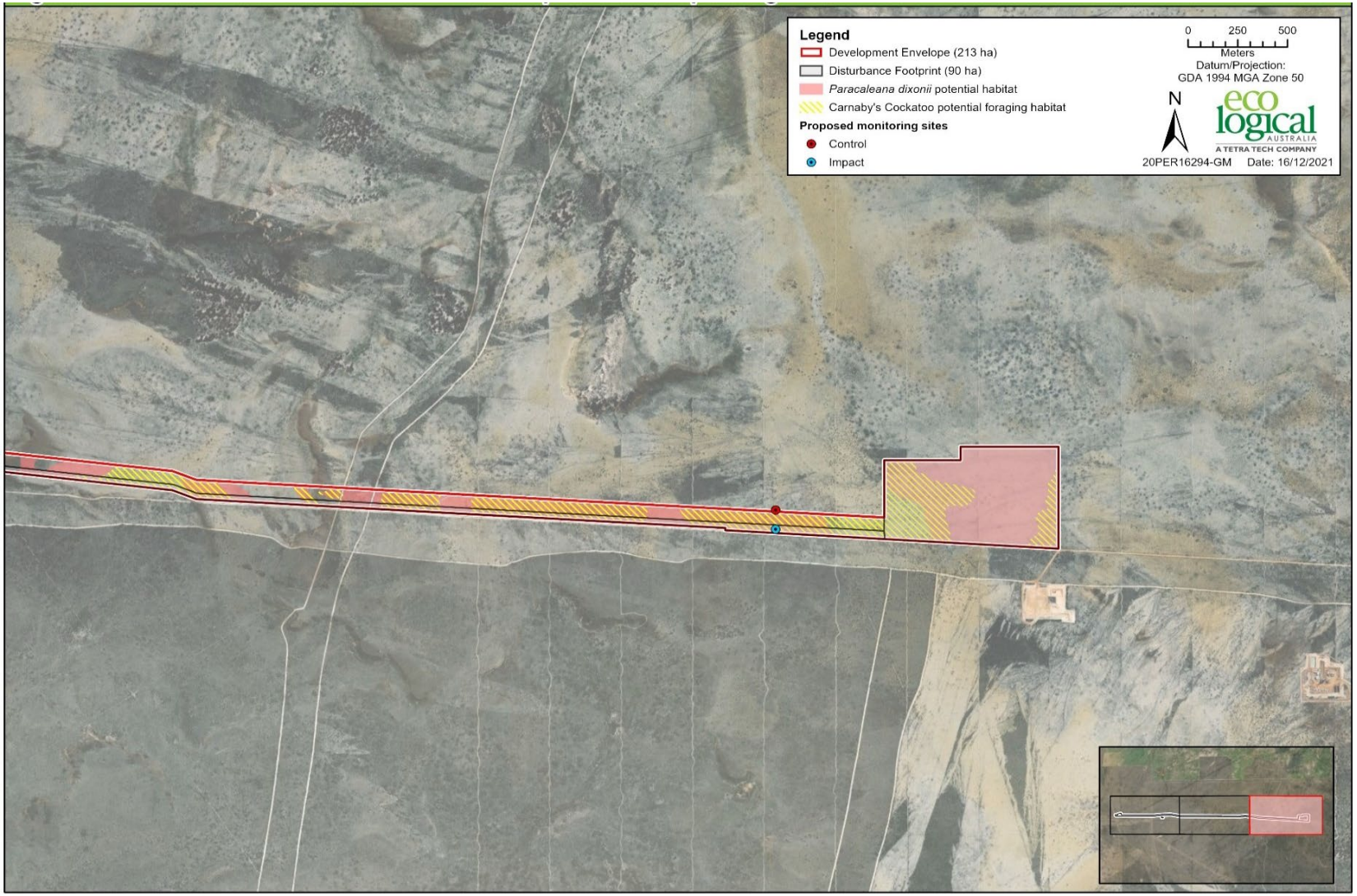

Figure 4-1 Rehabilitation zones within the Development Envelope (3/3)

3.5.4 Monitoring sites

Based on the existing information available for vegetation and fauna habitats, preliminary monitoring sites for each rehabilitation zone will be selected from which an assessment against the management targets can occur. Each monitoring site will comprise one rehabilitation site and one corresponding control site (10 x 50m in size). Six monitoring sites will be selected, including three for each rehabilitation zone to ensure appropriate replication of monitoring across the length of the Disturbance Footprint (Figure 3-1).

Monitoring sites will be located within the 'core' of rehabilitation zones to minimise the impacts of edge effects and to avoid transitional vegetation/habitats. Paired control sites will be located on undisturbed land within 300 m of the pipeline corridor but outside of the disturbance area. They will be established in the same native vegetation communities as the rehabilitation sites, to assist comparisons between rehabilitation and control area sites.

Control quadrats will be permanently demarcated with a steel fence dropper in the north-west corner, and wooden fence droppers in the north-east, south-east and south-west corners. Rehabilitation quadrats will not be permanently marked, but rather demarcated with GPS coordinates and reference photos only, this is due to safety reasons associated with the nature and depth of the high-pressure gas pipeline.

Photo monitoring points will be set up at each vegetation monitoring site to provide a visual comparison between sites, with two photographs taken at each site: one at the northwest and one at the southeast corner of each quadrat.

Additionally, priority species will be assessed through targeted surveys as outlined in EPA Technical Guidance – *Flora and Vegetation Surveys for Environmental Impact Assessment* 2016. As priority flora is present across the majority of vegetation communities (i.e. *Banksia scabrella* is 82.7 ha, *Lasiopetalum ogilvieanum* is 73.8 ha) the rehabilitation monitoring sites provided in Figure 3-1 represent the vegetation associations of the priority species identified in the disturbance footprint. These priority species layers are not represented in Figure 3-1 due to ease of understanding. However in comparison to vegetation associations as outlined in Table 3-3 for Paracaleana dixonii include EtAhHh, AcEbHh, EtBaHh and AcDdMi. These are similar to that of other key species including:

- *Banksia scabrella* – AcDdMi (~17ha), AcEbHh (~34 ha), EtAhHh (~26 ha), AcAhGp and BpDdHh
- *Lasiopetalum ogilvieanum* – AcDdMi, AcEbHh and EtAhHh

This establishes that the rehabilitation monitoring will include representation of all priority species vegetation associations as outlined in Table 6-7 of the proposal ERD. Namely all priority species exist within EtAhHh or AcEbHh.

If required, alternative monitoring sites will be established to ensure optimal siting within habitats and along the pipeline corridor.

3.6 Proponent experience with previous rehabilitation

The Proponent has a proven track record of rehabilitation success in arid environments, including for the original DBNGP constructed in 1981 in WA. Rehabilitation for the DBNGP commenced in 2007. In 2012, a performance review was undertaken in accordance with Condition 5-1 of Ministerial Statement 735, which requires the Proponent to submit a Performance Review every five years after the start of construction to the WA EPA (Strategen 2012). Soil and vegetation cover were the key focus for rehabilitation completion criteria for the DBNGP project. Results of compliance audits over the five-

year period found no potential non-compliances with conditions relating to management of soil cover and vegetation rehabilitation (Strategen 2012). Regarding soil cover, no evidence of soil erosion or sedimentation was observed or reported by any landholders (Strategen 2012). Three of the four completion criteria were met overall for vegetation rehabilitation in the Pilbara and Gascoyne regions of the project area and all survey sites had an average native species density equal to or greater than that of their respective control plots (Strategen 2012). The performance review found that 'construction impacts on watercourses were temporary and fully rehabilitated, utilising proven techniques to minimise future erosion potential' (Strategen 2012). Watercourse flows were managed to ensure no interruption to downstream ecological or anthropogenic uses (Strategen 2012).

These incorporated methods that enhanced rehabilitation were fauna management, acid sulphate soil treatment techniques, and the utilisation of Gluon with helicopter applications to cover sand dune rehabilitation works where truck use was limited. The DBNGP expansion project received an Earth award from the Civil Construction Federation of Australia for the successful use of the technique.

The Proponent also completed successful rehabilitation of the Fortescue River Gas Pipeline. The project included a 270 km pipeline from the DBNGP to Fortescue Metal Group's Solomon Hub operations in the Pilbara region of Western Australia. Construction commenced in 2014 and was completed in March 2015. Successful close out of completion criteria was achieved within three years. Rehabilitation programs have also been successful on the Wheatstone – Ashburton West Pipeline (87 km), the Onslow Lateral Pipeline (24 km) and is underway on the Tanami Natural Gas Pipeline (NT).

3.7 Security (tenure) of site

The Rehabilitation area falls within the proposed Pipeline Licence area and lease held (or to be held) by AGIO. The pipeline license and lease both include specific rights of entry and controls to limit authorised personnel to ensure the protection of the asset and for the purposes of this plan, the rehabilitation area. The plant location will also be under a lease from the Department of Planning, Lands and Heritage (DPLH)

The rehabilitation area shall be sign posted, with access points restricted to minimise any public access. However, based on the location this is deemed unlikely.

This land security (tenure) is regulated via Department of Mines, Industry Regulation and Safety (DMIRS) and DPLH. Both DMIRS and DPLH have included decommissioning and reinstatement requirements as part of the land tenure agreements and provide access rights to only authorised personnel which can be utilised to protect revegetated areas.

This tenure also requires AGIO's approval for any works (including third party) within the pipeline license or lease area which is another control to ensure the ongoing protection of the rehabilitation activities.

3.8 Management targets and timelines

Rehabilitation completion objectives are outlined in Table 3-4 to ensure completed rehabilitation provides suitable habitat for Paracaleana dixonii and Carnaby's Cockatoo and other priority species impacted by the proposal. The appropriateness of these objectives will be continually reviewed throughout the rehabilitation based on the outcomes of adaptive management measures outlined in Section 7. Monitoring and recording commitments are outlined in Table 3-4.

Table 3-4: Rehabilitation objectives, management targets and actions

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
To re-establish vegetation in line with management targets.	• Perennial native flora species diversity is equal to or greater than 40% of that of the adjacent control area at 36 months. • Perennial native flora species richness is equal to or greater than 40% of that of the adjacent control area and reflects the species composition present in the pre-disturbed vegetation type at 36 months. • Maintain where possible soil viability of long-term topsoil stockpiles	• Progressive rehabilitation undertaken to minimise the amount of disturbance time • Procedures for dust suppression • Topsoil and then cleared native vegetation will be re-spread over graded surfaces in an even layer to match the natural soil horizons and provide a seedbank of existing species • Limited access to areas beyond that disturbed by the Proposal • Fire management and response systems to be implemented. • Topsoil stockpiles actively managed to prevent loss and degradation including potential techniques such as aeration, mechanical disturbance (roll-over of soil) or surface area management (aim to maximise surface area).	• Monitor native vegetation rehabilitation sites and adjacent control sites to monitor aspects against management targets. • Control site/rehabilitation site transects. • Monitoring of photo point monitoring • Monitoring of vegetation health within Disturbance Footprint. Post Year 10 monitoring will include ecological community monitoring in each of the vegetation associations (where greater than 4 ha). Monitoring of long-term topsoil and other stockpiles for degradation and topsoil quality. This can include volume, microbial activity, soil respiration rate and invertebrate activity as well as presence of weeds.	Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist. Post Year 10 monitoring to include ecological community health and long-term soil stockpile health. This monitoring will occur every 3 years.	AGI Operations HSE Manager Rehabilitation Monitoring Report.
No increase of invasive weeds within the Development Envelope	Percentage of foliage cover of Declared species under the *Weeds Management Act*, Weeds of National Significance (WONS) and Buffel grass (*Cenchrus ciliaris*) is not greater than that of the adjacent control area at 36 months.	• Clean down procedure of vehicles prior to entering the Development Envelope to reduce cross contamination of weeds • Topsoil will be stockpiled for as little time as possible to minimise the amount of disturbance and potential for cross contamination by weeds • Targeted weed control in response to observations of new weed infestations or introduction of new weed species.	Monitor native vegetation rehabilitation sites and adjacent control sites to monitor aspects against management targets.	Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist.	AGI Operations HSE Manager Rehabilitation Monitoring Report
To re-establish conservation significant species habitat in line with management targets (Carnaby's Cockatoo) Applicable to Carnaby's Cockatoo potential foraging habitat only	• Perennial native flora species density and richness is equal to or greater than 50% of that of the adjacent control area and reflects the species composition present in the pre-disturbed habitat type at 36 months after completion of the Proposal. • Perennial native flora species density and richness coverages meets criteria described in West Erregulla Pipeline Flora and Fauna survey (ELA, 2021) for low quality foraging habitat for Carnaby's Cockatoo, that is projected	• Progressive rehabilitation undertaken to minimise the amount of disturbance time • Procedures for dust suppression • Topsoil and then cleared native vegetation will be re-spread over graded surfaces in an even layer to match the natural soil horizons. • Implement traffic conditions including speed limits, signage, and limited access to areas beyond that disturbed by the Proposal	Monitoring of rehabilitation and control sites. Monitoring will include indications of: • Re-establishment of *Banksia* spp. and occasional *Eucalyptus todtiana* mid open woodland over shrubs and sedgeland on sandy plains habitat, except within 3m of pipeline. • Re-establishment of suitable foraging species for Carnaby's Cockatoo. • Observation surveys, including timed bird surveys and active searching, would be completed in line with *Technical Guidance – Terrestrial vertebrate fauna*	Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist. Monitoring post Year 10 will be in consultation with EPA where criteria has been met to conduct fauna and cockatoo specific survey work (Observation Surveys) to inform on presence in the area. This would be 3 yearly events.	AGI Operations HSE Manager Rehabilitation Monitoring Report.

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
	foliage cover of preferred foraging species is greater than 2%. • Note that within 3 m either side of the pipeline, the management target will only apply to ground cover species and not to tree species (restricted rehabilitation zone), which are not suitable to grow in close proximity to the pipeline. Tree species will be allowed to recover outside of the 6 m corridor.	• Maintain fauna sightings and incident register for injured or deceased fauna during construction • Structural habitat elements such as timber and rocks shall be reinstated over the rehabilitation area, such as small amounts of rocks and stones generated by the construction process • Fire management and response systems to be implemented.	*surveys for environmental impact assessment* (EPA, 2020). • Observation surveys will also be used Post Year 10.		
Re-establish suitable habitat to facilitate potential growth of *P. dixonii*	• Perennial native flora species density and richness is equal to or greater than 50% of that of the adjacent control area and reflects the species composition present in the pre-disturbed habitat type at 36 months after completion of the Proposal. • Design ongoing access to eliminate any potential for impacts to species • Improve habitat values through reduction of weed incursion risk, pest animals and where possible, fire risk	• Rehabilitation monitoring includes a one day targeted survey for species within rehabilitation area • Progressive rehabilitation undertaken to minimise the amount of disturbance time • Procedures for dust suppression • Topsoil and then cleared native vegetation will be re-spread over graded surfaces in an even layer to match the natural soil horizons and provide a seedbank of existing species. • Implement traffic conditions including speed limits, signage, and limited access to areas beyond that disturbed by the Proposal • Maintain fauna sightings and incident register for injured or deceased fauna during construction • Structural habitat elements such as timber and rocks shall be reinstated over the rehabilitation area, such as small amounts of rocks and stones generated by the construction process • Fire management and response systems to be implemented. • Participate in region wide feral animal control programs where suitable	• Monitoring will include specific one day targeted search for species inside its specific flowering period (Nov-Jan) to confirm presence (if possible) at monitoring periods. • Link to proposed research monitoring. • Monitoring of habitat values (weed, pests, fire risk and fire response)	Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist. Post Year 10 monitoring will include habitat value assessment and be conducted every 3 years. Targeted surveys shall also be conducted every 3 years for the species presence in the rehabilitation locations.	AGI Operations HSE Manager Rehabilitation Monitoring Report.

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
To re-establish conservation significant species habitat in line with management targets for multiple habitats of priority species including *Lasiopetalum ogilvieanum* and *Banksia scabrella.*	• Perennial native flora species density and richness is equal to or greater than 50% of that of the adjacent control area and reflects the species composition present in the pre-disturbed habitat type at 36 months after completion of the Proposal. • Design ongoing access to eliminate any potential for impacts to species • Improve habitat values through reduction of weed incursion risk, pest animals and where possible, fire risk • Evidence of *Lasiopetalum ogilvieanum* (P1) re-establishment at a minimum of five locations within the Disturbance Footprint within 48 months of rehabilitation commencing. • Evidence of *Banksia scabrella* (P4) re-establishment at a minimum of three locations within the Disturbance Footprint within 48 months of rehabilitation commencing.	• Progressive rehabilitation undertaken to minimise the amount of disturbance time • Procedures for dust suppression • Topsoil and then cleared native vegetation will be re-spread over graded surfaces in an even layer to match the natural soil horizons. • Implement traffic conditions including speed limits, signage, and limited access to areas beyond that disturbed by the Proposal • Maintain fauna sightings and incident register for injured or deceased fauna during construction • Structural habitat elements such as timber and rocks shall be reinstated over the rehabilitation area, such as small amounts of rocks and stones generated by the construction process • Fire management and response systems to be implemented. • Participate in region wide feral animal control programs where suitable • Where *Lasiopetalum ogilvieanum* (P1) or *Banksia scabrella* (P4) has not re-established within the Disturbance Footprint within 48 months, seed previously collected will be collected from retained locations of the species within the Development Envelope. The seed will be treated and planted within the Disturbance Footprint within the relevant vegetation communities.	Monitor priority species rehabilitation sites and adjacent control sites to monitor aspects against management targets. • Control site/rehabilitation site transects. • Monitoring of photo point monitoring • Monitoring of vegetation health within Disturbance Footprint. Targeted survey monitoring for all priority species identified in the previous surveys specifically in regard to number of locations and individuals of *Lasiopetalum ogilvieanum and Banksia scabrella.* This will include species resilience and assessment of individual health (i.e. self-sustaining through seed production and recolonization processes) Monitoring will also review success of reseeding programs at seeding locations in comparison to non-seeded locations. Monitoring of habitat values (weed, pests, fire risk and fire response)	Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist. Monitoring will continue until such a time that the species is re-established at a minimum of five locations (*Lasiopetalum ogilvieanum)* and three locations (*Banksia scabrella)* within the Disturbance Footprint. Post Year 10 monitoring will include habitat value assessment and be conducted every 3 years as well as targeted surveys to assess individual numbers of priority species present in rehabilitation areas. In consultation with EPA, targeted surveys may continue post Year 10 (every 3 years) to confirm success of rehabilitation in providing long term improvements for priority species.	AGI Operations HSE Manager Rehabilitation Monitoring Report.

4. Land Acquisition

4.1 Environmental management objectives

The securing of the proposed land acquisition site and transfer to a conservation covenant will manage potential degradation of habitat within the land acquisition site from:

- Direct loss of habitat through clearing of native vegetation
- Introduction and/or spread of weed species
- Degradation of habitat through dumping of waste
- Degradation of habitat by livestock and introduced pest animals.

The following management objectives will apply to the proposed land acquisition site:

- Notification on the land title to include the conservation covenant.
- No domestic stock within the offset area.
- No increase in cover of high threat pest plants beyond current levels.
- Control of foxes and feral cats through participation in regional control programs.
- Control of rabbits through participation in regional control programs.

4.2 Offset Property

Figure 4-1 – Offset site Location

Figure 4-2 – Offset site in Comparison to Proposal

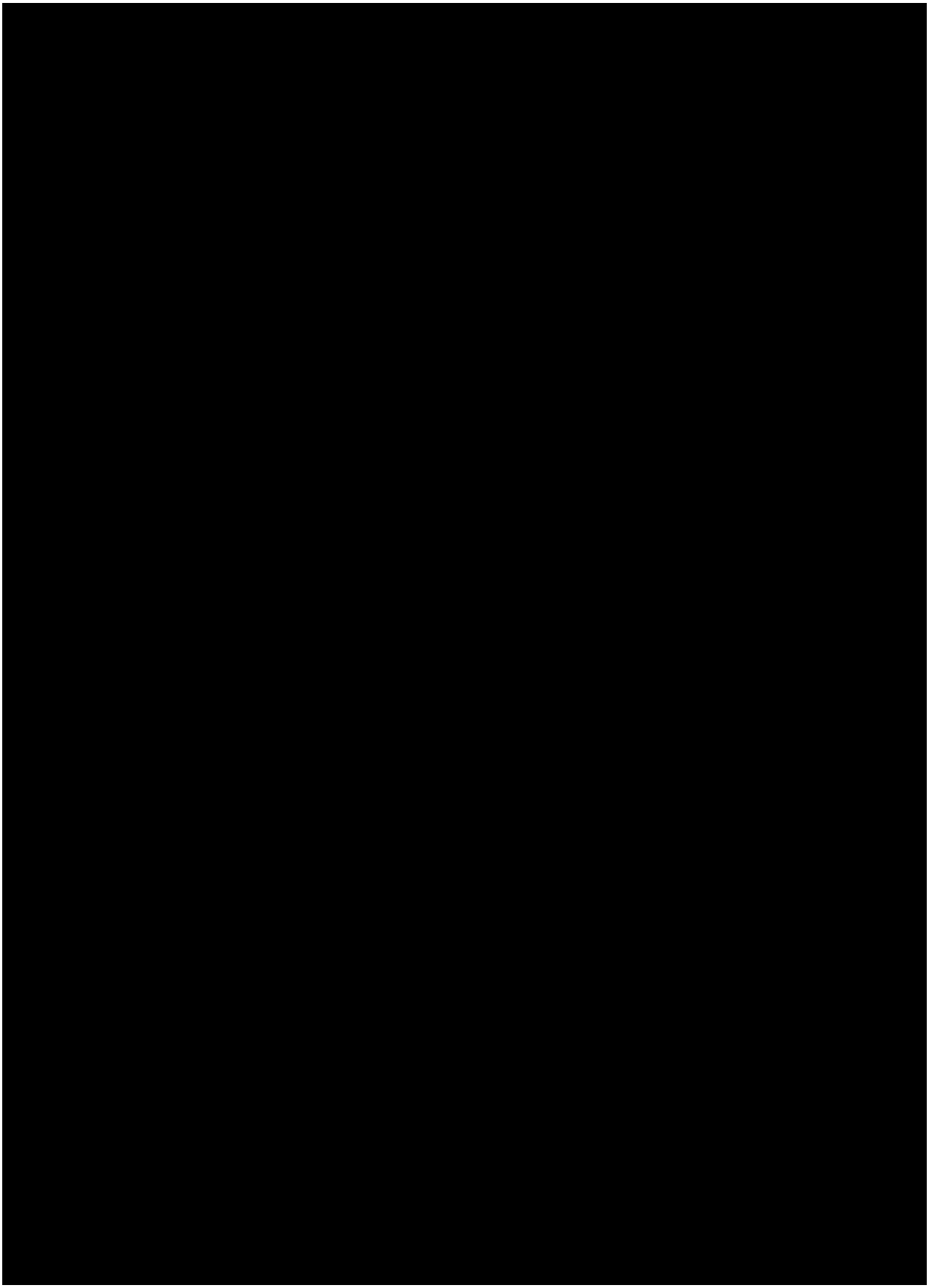

Figure 4-3 AGIO Proposed allocation in partnership with Strike Energy

4.2.1 Environmental Attributes of Offset Property

The 564 ha offset site location was surveyed through vegetation and flora condition and values present by Mattiske in 2021 (Attachment C). This helped to identify suitable understanding to determine capacity as an offset location. The survey was conducted in accordance with Methods outlined in *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016). A total of seven survey sites consisting of 10 m x 10m relevé quadrants were utilised.

Additional survey work of the offset site was completed by Strategen JBS&G (2022) including vegetation mapping and survey details (Attachment D). This is supplied to EPA as spatial data as well as supporting the Mattiske survey work. Mattiske 2021 outlined the following:

Within the 7 relevé quadrats 103 species were found. Each of the seven sites were completed in different communities with five different heath communities, one open forest and one woodland recorded. Two of the sites were burnt (B) within 5 years.

H1 Heathland of Melaleuca concreta, Gastrolobium plicatum, Melaleuca marginata and Allocasuarina campestris with isolated clumps of mallee Eucalyptus arachnaea subsp. arachnaea over Lepidosperma ?sp. Bandalup Scabrid (N. Evelegh 10798) and Stylidium torticarpum (P3) on clay slopes.

HS(B) Open Heathland of Melaleuca systena, Scholtzia laxiflora and Pileanthus filifolius over an open sedgeland of Mesomelaena pseudostygia, Ecdeiocolea monostachya and Lepidobolus sp. with emergent Xylomelum angustifolium and Eucalyptus todtiana on grey clay sand dunes.

H3 Closed Heathland of Melaleuca aspalathoides, Petrophile shuttleworthiana and Hakea auriculata over a sedgeland of Ecdeiocolea monostachya over mixed forbs on grey clay sand upper slopes.

H$ Heathland of Calothamnus longissimus, Melaleuca carrii and Banksia fraseri over Ecdeiocolea monostachya and Conostylis androstemma on low laterite breakaway.

H5(B) Heathland of Hibbertia hypericoides, Melaleuca aspalathoides and Melaleuca leuropoma over Desmocladus asper and mixed shrubs with occasional Allocasuarina campestris on low grey sand dunes.

F1 Open Forest of Eucalyptus wandoo, over open shrubland of Melaleuca concreta, Rhagodia preissii and Gastrolobium plicatum over Acacia sp., Desmocladus asper and Acanthocarpus canaliculatus on brown sandy clay loam slopes.

W1 Open Woodland of Eucalyptus todtiana over an open Shrubland of Banksia leptophylla, Eremaea beaufortioides, Calothamnus sanguineus and Hibbertia hypericoides over mixed low shrubs and forbs on low grey sand dunes.

The offset site includes presence of cockatoo habitat, historical records of *P.dixonii* and presence of *B. scabrella*. Vegetation associations and communities as outlined above represent those being impacted by the proposal and match against Cockatoo habitat and vegetation for *Lasiopetalum ogilvieanum.* The offset site meets a number of criteria set out in the EPA guidance including:

- Relevant and proportional based on calculators, location and vegetation community representation
- Similar habitat structure and contiguous with the existing vegetation in the area and the proposal site
- Allows for security over a privately owned intact vegetated area and contains or historically contained rare and priority species.

4.3 Key assumptions and uncertainties

A number of factors that represent risk to the success of the enhancement of the land acquisition site are described below. The objectives, management targets and actions for the land acquisition site (Table 4-1), and corrective actions (Table 7-2) have been designed to try to minimise these risks wherever possible.

- **Increase in weed cover and diversity:** weeds can be introduced and/or spread to the Development Envelope via vehicles and equipment. New species can be introduced, or existing infestations can be spread into new areas. Weeds could degrade habitat for *Paracaleana dixonii* and Carnaby's Cockatoo within the land acquisition site.
- **Extreme weather**: extreme or unexpected weather events, such as flooding or drought, could wash away topsoil, modify landforms through erosion, or reduce recruitment and/or provision of foraging material due to lack of rainfall. These negative impacts could limit the availability of suitable habitat for *Paracaleana dixonii,* other priority species and Carnaby's Cockatoo foraging habitat within the land acquisition site
- **Fire:** wildfires, particularly unusually hot or out of control fires, have the potential to burn habitat for all species and reduce the availability of foraging material for the Carnaby's Cockatoo.
- **Introduced fauna:** introduced herbivores, such as cattle, sheep and rabbits, could graze on young plants including *Paracaleana dixonii* plants, thereby limiting the potential for recruitment of *Paracaleana dixonii*.

The Proponent is ultimately responsible for ensuring the management of the land acquisition site results in the completion criteria being reached within the allocated timeframe. However, there are some factors such as extreme weather events and fires that are outside of the control of the proponent. Where these events occur, this Management Plan will be reviewed to determine whether additional management actions are required to ensure the land acquisition site is able to meet the completion criteria within the allocated timeframe. Variations to this plan would be undertaken in consultation with ecologists, DWER, DBCA, DCCEEW and, where appropriate, other Government Agencies with expertise in the management of threatened species and habitat.

4.4 Security

The proposed offset site will be secured under a conservation covenant. A conservation covenant is a permanent legal agreement placed on a landholder's Certificate of Title ensuring that the offset measures undertaken are enduring in terms of their maintenance of the local habitat values. The covenant runs with the land in perpetuity. Conservation covenants are between the Commissioner of Soil and Land Conservation and private landholders under Part IV of the Soil and Land Conservation Act 1945 (WA).

4.5 Management Actions

Once the conservation covenant has been listed on the Land Title the following actions will be undertaken where required to improve the condition of habitat for *Paracaleana dixonii* and Carnaby's Cockatoo and the other priority flora species.

4.5.1 Removal of waste

Any waste identified will be removed. At the time that waste is removed an assessment of the ground condition will be completed, to determine whether any follow up actions are required to encourage regeneration of native vegetation at the site of waste removal.

The areas from which any waste is proposed to be removed will be monitored as part of the habitat condition monitoring described at 6.2.1. Where regeneration of native vegetation is not considered adequate, contingency measures will be implemented as described at Section 7.2.

4.5.2 Weed control

The weed control works are to be conducted by the landowner or a contractor that is licensed and experienced with working in high quality habitat environments.

Herbaceous weed management requirements will include (at minimum):

- Control herbaceous and grassy weeds and ensure that weed cover does not increase within the land acquisition site area
- Monitor for and control new and emerging woody and herbaceous weeds.

The spread of high threat herbaceous weeds is to be managed within the land acquisition site and, where practicable to do so, infestations are also to be eliminated. This will involve treatment of all herbaceous weeds on site through careful and judicious use of herbicides and the application of manual control methods wherever practicable. Emphasis is to be placed on ensuring that herbaceous weed cover levels do not increase within the land acquisition site, and that infestations are not able to spread into neighbouring areas.

All care must be taken to avoid off-target impacts and the loss of native vegetation or habitat, and to ensure that there is no spill or inadvertent drift of chemical into the land acquisition site. The use of herbicides is to be in accordance with the manufacturer's instructions (label instructions) and is to be minimised wherever practicable, with preference given to manual control techniques.

4.5.3 Pest control

The intent of feral animal control programs is to reduce ecological pressures associated with grazing and degradation of habitat areas and predation. Feral animals include foxes, cats and rabbits. The intent is to prevent the spread of, and as far as possible eradicate any established pest animals within the Land acquisition site. Successful control of pest animals will result in reduced predation and material gains in the habitat conditions on site. All care must be taken to avoid off-target impacts or inadvertent harm to native fauna. Regardless of the control option(s) used, these must be the most effective, safe and humane methods available.

Any new or emerging pest animal threats identified during the monitoring program are to be treated promptly by the landowner or an engaged contractor and addressed by the proponent in a timely manner.

4.5.4 Survey

A spring survey (targeted survey) will be conducted for priority species at the offset location as outlined in Table 4-1 and include overall health and condition scoring to establish ongoing improvements to the offset site. Surveys are to be conducted as transect surveys in line with EPA Guidelines. This will occur in the same timeframe as set out in 4.5.5 and every 3 years post the 10-year mark. This includes specific species as well as general health of the offset location.

4.5.5 Targeted Survey for *Paracaleana dixonii*

A targeted survey for *Paracaleana dixonii* is to be conducted at intervals of years 1, 4, 7 and 10. This species is considered to generally flower in November and December. Targeted surveys are to be undertaken in all areas of potential habitat identified within the land acquisition site including areas where the species has previously been recorded. Potential habitat for this species is considered to be sandy areas throughout the land acquisition site. Surveys are to be conducted in a loose grid to ensure all areas of the land acquisition site are adequately searched. Searches are to be conducted by a minimum of two qualified and experienced botanists, generally spaced at a distance of 30-50m apart. This distance would be reduced in areas of denser vegetation and in the immediate vicinity of individuals observed as per the method described in Woodman Environmental Consulting (2013).

4.6 Management targets and timelines

Within 12 months of the commencement of ground disturbing activities, the Proponent will secure the offset area into a conservation covenant to ensure the long-term protection of Carnaby's Cockatoo, *Paracaleana dixonii* and other priority species habitat.

Table 4-1 outlines the timeline for performance objectives to be achieved within the first 10 years for the land acquisition site. At the completion of the 10 years, Strike West Pty Ltd West in partnership with AGIO a will undertake any additional management actions identified or required on an ongoing basis to retain the quality and extent of habitat for Carnaby's Cockatoo and *Paracaleana dixonii* at the land acquisition site in perpetuity.

Table 4-1 Land acquisition objectives, management targets and actions

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
Land protected via conservation covenant in agreement with landholder	Offset secured via conservation covenant for perpetuity.	Land title includes conservation covenant.	Not required	Within 12 months of the commencement of ground disturbing activities	AGIG Land Acquisition Site Monitoring Report as part of first annual compliance report
Stock excluded from land acquisition site.	No stock within the land acquisition site. Construct and/or upgrade fencing as required to prevent stock from accessing the offset area.	Construct and/or upgrade fencing as required to prevent stock from accessing the offset area.	Inspect land acquisition site for evidence of damage from incursion of domestic stock. Where fence is required, inspect fence to determine whether repairs are required	Construct fence within 12 months of conservation covenant agreement being finalised. Ongoing	Landowner/Contractor Land Acquisition Site Monitoring Report as part of first annual compliance report
No increase of invasive weeds within the land acquisition site.	No increase in cover of herbaceous weeds beyond current levels. Minimise off-target damage; avoid impacts to remnant vegetation and habitat.	Targeted weed control in response to observations of new weed infestations or introduction of new weed species.	Monitor weed cover at land acquisition site against management targets.	Baseline survey prior to ground disturbance works to assist in monitoring. Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or	Landowner/Contractor Rehabilitation Monitoring Report Annual Report to include details of completion of weed control activities.

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
				on advice of an environmental specialist. Post Year 10, targeted surveys to be completed every 3 years. Ongoing (annual) weed control activities to be completed	
No increase of pest animals within the land acquisition site.	Participation in regional control programs. Controlled foxes, rabbits and cats.	Participate in regional control programs aimed at reducing numbers of foxes, rabbits and cats. Targeted pest animal control in response to observations/evidence of pest animals within the land acquisition site.	Monitor pest animal presence at land acquisition site against management targets.	Baseline survey prior to ground disturbance works to assist in monitoring. Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist. Post Year 10, targeted surveys to be completed every 3 years.	Landowner/Contractor Rehabilitation Monitoring Report Annual Report to include details of completion of pest control activities.

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
				Ongoing (annual) pest control activities to be completed	
Improve habitat values for *Paracaleana dixonii* and other priority species suitable within land acquisition site including *Lasiopetalum ogilvieanum* and *Banksia scabrella.*	Perennial native flora species density and richness is maintained or improved within habitat identified for *Paracaleana dixonii*. Improve habitat values through control of weeds, pest animals and removal of waste and where required remediation of affected areas.	Remove any waste identified within the land acquisition site. Remediate areas to restore habitat values where required following removal of waste. Undertake management actions listed above to reduce degradation of habitat values from introduced weeds and pest animal. Conduct seasonal targeted survey for *Paracaleana dixonii*	Monitor perennial native flora density and richness at land acquisition site against management targets. Targeted surveys to be conducted at required timing (generally a spring and a December survey) to cover these species. Habitat value / ecological health assessment including weed presence, fire risk and evidence of pests. Monitoring will also review success of reseeding programs at seeding locations in comparison to non-seeded locations.	Waste removal within 12 months of conservation covenant agreement being finalised. Monitor at years 1, 4, 7 and 10 post-construction. Monitoring intervals will be reduced if required to meet the management target or on advice of an environmental specialist. Post Year 10, targeted surveys to be completed every 3 years. Where reseeding has occurred, this will be assessed every 3 years.	Landowner/Contractor Rehabilitation Monitoring Report

Objective	Management target	Management actions	Monitoring	Timing/ frequency of actions	Responsibility and Reporting
Improve habitat values for Carnaby's Cockatoo	Projected foliage cover of preferred foraging species is greater than 2% in areas identified within the land acquisition site as low-quality foraging habitat for the Carnaby's Cockatoo. Improve habitat values through control of weeds, pest animals and removal of waste and where required remediation of affected areas.	Remove waste identified within the land acquisition site. Remediate areas to restore habitat values where required following removal of waste. Undertake management actions listed above to reduce degradation of habitat values from introduced weeds and pest animal.	Monitor foliage cover of preferred foraging species at land acquisition site against management targets. Habitat value / ecological health Observation surveys for fauna including specifically for cockatoos.	Monitor at years 1, 4, 7 and 10 post-construction. Post Year 10, fauna observation surveys to be completed every 3 years.	Landowner/Contractor Rehabilitation Monitoring Report

5. Indirect offset

With little current knowledge and understanding of *Paracaleana dixonii*, DCCEEW have included potential for an indirect offset to be included to address the impacts to the known vegetation types and local habitat from the proposed activity. This is the key focus of the offset for this species with the land acquisition being an additional positive outcome.

This includes two key aspects:

1. Research component
2. Community awareness of the species

The funding for this indirect work will be confirmed in consultation DCCEEW as part of a commercial agreement with a proposed minimum of $1,500 / ha of impact to be confirmed in consultation with the third-party delivery partner and DCCEEW.

5.1 Research

The research component has been developed in consultation with Dr Kingsley Dixon and using the Conservation Guidance (2008) for the species.

The priorities for research are:

- Review the current conservation guidance and provide information for potential updating
- Develop a monitoring program including known populations and support this in conjunction with planned rehabilitation monitoring
- Conduct additional targeted survey work in the adjacent 18,000 ha
- Assess current population including ecological requirements and impacts of threatening processes
- Potential pollination biology
- The re-emergence post the recent fire in the disturbance envelope area and how fire has potentially impacted the species. This links to timing of the fire within the potential growth stage of the plant.

Additionally, to address the other priorities and actions in the Conservation Guidance 2008 the project will look at:

- The success of any previous management actions including Beekeepers Reserve
- Current fire strategies and impacts
- Current hygiene (dieback) controls or lack of controls and potential impacts in surrounding area
- Investigate options for propagation of common Paracaleana species as an insurance activity to optimise propagation and transfer to soil for the genus which demonstrates difficulties in key propagation stages
- Identify locations for potential future work to link or enhance known populations

5.2 Community awareness

The Proponent will undertake to contribute knowledge of the species and the research being completed to the local community including schools. Specifically, this will include an annual update and electronic brochure as part of a frequent community awareness program (every 2 years) including for local community groups and schools. The Proponent will keep the Western Australia Native Orchid Study and Conservation Group (WANOSC) advised of the research program and potential for participation in

targeted surveys or field work. This information will be drafted by the Proponent and reviewed by the local relevant regulator prior to distribution to link to any other projects underway.

5.3 Conservation outcomes

The planned research and works aim to have the following outcomes for the species:

- Increased knowledge of species ecology
- Potential for use of propagation as a tool to increase population numbers
- Increased understanding and management of threats to the species and also knowledge of resilience and response to disturbance such as bushfires
- Understanding of potential impacts of dieback on the species
- Improved knowledge through surveys of presence in the regional area
- Improved knowledge of the species to assist local community groups in both identification and protection (management) of the species. This includes WANOSC and utilisation of citizen survey outcomes

6. Monitoring

6.1 Rehabilitation Monitoring Program

The monitoring program has been designed to ensure that rehabilitation objectives and management targets are achieved, indicating reinstatement has been undertaken to the appropriate standard and rehabilitation is successful. Monitoring focuses on the success of revegetation of cleared areas to ensure that habitats capable of supporting known conservation significant species or with potential to occur in the Development Envelope, are re-established.

Following the completion of construction, appropriately sized quadrats will be established at each of the pre-determined monitoring (rehabilitation and control) sites (Figure 3-1). Each quadrat will be permanently demarcated with fixed markers (e.g. fence dropper) and GPS coordinate locations of each quadrat corner will be recorded. Monitoring site locations and quantity will be determined in reference to *A Guide to Preparing Revegetation Plans for Clearing Permits (DWER, 2018)* specifically Section 6.

Rehabilitation monitoring will occur at rehabilitation and control sites at specified times, at a time of year when floristic material allowing plant identification is most likely to be available for most species to minimise the effects of seasonality.

Photo monitoring points will be established at representative locations within each monitoring site and recorded with a GPS. At each point, two photographs will be taken along each direction of the pipeline corridor. All photos will be date stamped and photo number recorded with appropriate details (monitoring site number and direction of photo).

Fauna usage of the rehabilitated area will be monitored in tandem with vegetation monitoring. Observation surveys, including timed bird surveys and active searching, would be completed in line with *Technical Guidance – Terrestrial vertebrate fauna surveys for environmental impact assessment* (EPA, 2020).

Data collection will be comparable and repeatable between monitoring sites and across monitoring years. After each monitoring event, data collected from each rehabilitation site will be compared with its corresponding control site, and results will be compared across the entire Development Envelope. Each year of monitoring will compare results to the previous monitoring results, including an assessment of each rehabilitation zone against the management targets (Table 3-4). Where deficiencies are encountered such as the presence of weeds or a low diversity or coverage of native vegetation, corrective actions (Table 7-1) may be required to ensure completion criteria are met by the end of the ten-year monitoring period. In this circumstance the time to subsequent monitoring may be reduced as directed by the environmental specialist to ensure any corrective actions are successful.

6.2 Land Acquisition Site Monitoring Program

6.2.1 Habitat Condition Monitoring

The quality of habitat for Carnaby's Cockatoo, *Paracaleana dixonii* and the two priority flora species will be assessed at intervals of years 1, 4, 7 and 10, using a consistent proforma, and with photographs taken. Where relevant, any additional works required to improve habitat quality (particularly within areas identified for weed control) will be identified.

Appropriately sized quadrats will be established at each of the pre-determined monitoring sites, this is to include five sites in suitable habitat for *Paracaleana dixonii* and five sites in suitable habitat for the Carnaby's Cockatoo. Sites selected for both species encompass all other priority species habitats.

Each quadrat will be permanently demarcated with fixed markers (e.g. fence dropper) and GPS coordinate locations of each quadrat corner will be recorded.

Within each quadrat, the following data will be recorded:

- Site number
- Native flora species density (plants per m2)
- Native flora species richness (per quadrat)
- Weed foliage cover (%)
- Indicators of the presence of fauna (e.g., evidence of foraging by Carnaby's Cockatoo)
- General observations (i.e., feral animal disturbance, fire occurrence).

For sites in Carnaby's Cockatoo habitat the percentage cover of suitable foraging species would also be recorded.

6.2.2 Photo points

Permanent photo-points are to be established at each quadrat site location. Photographs taken from these points are to be representative of the habitat conditions and are to provide a visual and temporal assessment of the effectiveness of meeting objectives set out in this EPBC ROMP. Photographs are therefore to be taken from each photo-point and will use the same general direction, trajectory and camera settings as is practicable. The location of photo-points is to be permanently marked on site using painted star-pickets (or equivalent) and as recorded on an aerial map of the land acquisition site.

7. Adaptive management and review

7.1 Management plan review

The environmental management system outlined in the CEMP provides for ongoing review and improvement of existing systems and controls. This ROMP forms part of this process and as a result objective management may be adapted in response to the outcomes of:

- Any changes (inclusion or removal) to regulatory listing of conservation significant species
- Any changes to conservation significant species habitat guidance (that may alter rehabilitation zones or extent of suitable habitat)
- Outcomes of monitoring or contingency actions
- Improved methods
- Increased knowledge (e.g., obtained through surveys or government advice).

The appropriateness of objectives and management targets will be continually reviewed throughout their application using monitoring results. Any changes would be made in agreement with relevant government agencies.

7.2 Contingencies and corrective actions

If monitoring indicates that objectives and management targets for rehabilitation or the land acquisition site are not being achieved, or are unlikely to be achieved within ten years, contingencies and corrective actions will be enacted. These are provided in Table 7-1 for the rehabilitation site and Table 7-2 for the land acquisition site.

Table 7-1 Rehabilitation contingencies and corrective actions

Trigger	Action
Native flora density and richness has not achieved at least 40% of adjacent control areas at any time from year 4 onwards.	1. Investigate cause of reduced recruitment (this could include review of weather conditions, review of threatening processes such as erosion or fire). 2. Remediate cause, if possible, which could include implementing additional revegetation techniques (direct seeding or planting seedlings) in particular those focused on restoring key conservation significant species habitat values or addressing any threatening processes that may be influencing results. The species selected will be based on those identified in the Development Envelope (ELA 2020a) and seed collection will occur in the direct local area (adjacent to site) to ensure local endemic species are utilised. Rates of application of seed (density) will be advised by an environmental specialist at the time of seeding. 3. Monitor the effectiveness of any measures implemented during future monitoring events, until management target is achieved.
Weed foliage cover (%) for Declared, WONS, Buffel grass is greater than that in adjacent control areas.	1. Investigate cause for higher weed cover (this could include reviewing access to area or weed control approaches). 2. Implement weed control to reduce weed cover where this is required and address any threatening processes that may influence results. 3. Monitor the effectiveness of any measures implemented during future monitoring events, until management target is achieved.

Table 7-2 Land acquisition site contingencies and corrective actions

Trigger	Action
Native flora density, richness of areas from which waste and/or weeds were removed has not achieved at least 50% of surrounding areas 4 years from removal of waste/weeds.	1. Investigate cause of reduced recruitment (this could include review of weather conditions, review of threatening processes such as erosion or fire). 2. Remediate cause, if possible, which could include implementing additional revegetation techniques (direct seeding or planting seedlings) in particular those focused on restoring key conservation significant species habitat values or addressing any threatening processes that may be influencing results. 3. Monitor the effectiveness of any measures implemented during future monitoring events, until management target is achieved.
Evidence of *Lasiopetalum ogilvieanum* (P1) re-establishment at a minimum of five locations and *Banksia scabrella* (P4) at three locations within the Disturbance Footprint within 48 months of rehabilitation commencing.	1. Direct seed collection within undisturbed area of Development Envelope of *Lasiopetalum ogilvieanum* and/or *Banksia scabrella.* 2. Treatment and application of seed to suitable vegetation habitat areas to promote re-establishment. 3. Monitor the effectiveness of any measures implemented during future monitoring events, until management target is achieved.
Weed foliage cover (%) has increased beyond levels assessed at the time of transfer of the land acquisition site	1. Investigate cause for higher weed cover (this could include reviewing access to area or weed control approaches). 2. Implement weed control to reduce weed cover where this is required and address any threatening processes that may influence results. 3. Monitor the effectiveness of any measures implemented during future monitoring events, until management target is achieved.
Evidence of pest animals (scats, tracks, burrows) has increased beyond levels assessed at the time of transfer of the land acquisition site	1. Investigate cause for higher pest animal numbers (this could include reviewing access to area or pest control approaches). 2. Implement appropriate pest control to reduce pest animal numbers where this is required and address any threatening processes that may influence results. 3. Monitor the effectiveness of any measures implemented during future monitoring events, until management target is achieved.

Contingency and corrective actions would be implemented, as required, until management targets are achieved. This is expected to occur within three to five years of initial works being completed. Monitoring will continue to occur until Year 10. If, in the unlikely event that contingency and corrective actions still fail to meet the requirements of the management targets, an alternative course of action

will be devised that is jointly agreed upon by all relevant stakeholders (i.e. AGI Operations, DCCEEW, DMIRS, DWER and EPA).

7.3 Reporting

7.3.1 Rehabilitation Reporting

A Rehabilitation Monitoring Report will be prepared post each monitoring activity that will identify the following:

- Any changes to rehabilitation approach, actions and monitoring due to new knowledge regarding the presence/absence of conservation significant species
- A summary of monitoring results in comparison to objectives and management targets
- Any contingency actions implemented
- Any other issues encountered (e.g., fire occurrence).

The status of rehabilitation progress against the management targets (whether they have been met or the level of achievement), will be reported to the aforementioned government agencies.

7.3.2 Land Acquisition Site Reporting

The monitoring reports for the land acquisition site are to detail progress made against the commitments set out in this Plan. Monitoring reports are designed to provide enough detail in the form of written comments and supporting evidence that an assessor can easily determine the completion of/progress against the commitments for each management action.

Details of the monitoring reports are to include (but not be limited to):

- Results of monitoring conducted on site of fencing, weed control programs and pest/feral animal control actions
- Management works completed within the land acquisition site including the results of weed control programs to maintain or reduce the current coverage of herbaceous weed species, and the maintenance of greater than 2% coverage of foraging species for the Carnaby's Cockatoo where medium shrubs are currently present
- Results of the *Paracaleana dixonii* monitoring programs including any findings on the frequency of flowering and response to fire events
- Details of any events or impacts that have affected the land acquisition site such as changes to natural hydrology and water flow regimes, illegal access by pedestrians, and any associated impacts, or any events that have had a material impact on habitat for the Carnaby's Cockatoo and Paracaleana dixonii.

The results of the monitoring programs are to be reported to DBCA, DCCEEW, EPA and AGIG. Any major breaches of the management programs and/or impacts on the target species is to be reported immediately to AGIG where identified by an engaged contractor. This monitoring will occur in conjunction with the rehabilitation monitoring timeframes proposed.

8. Offset Guide Inputs and Justification

8.1 EPBC Act Offsets Assessment

The EPBC offset calculator has been consulted to provide an offset assessment guide (parameters) associated with the clearing of the Carnaby's Cockatoo foraging habitat and impacts to *Paracaleana dixonii*.

8.1.1 Carnaby's Cockatoo

Based on a combination of rehabilitation within the Disturbance Footprint and the acquisition and protection in perpetuity of comparable Carnaby's Cockatoo habitat at an off-site location, the proposed offset package will directly offset approximately 108% of the residual impact of the Proposal on Carnaby's Cockatoo.

Calculations have been conducted using the EPBC offset calculator to determine how the proposed conservation gains may correlate to and adequately compensate for the impact to Carnaby's Cockatoo habitat. EPBC offset calculations are provided in Attachment A, with justification for the input values detailed in

Table 8-1 and Table 8-2.

Table 8-1: EPBC Act Offset Calculator for Carnaby's Cockatoo habitat rehabilitation

Parameter	Input	Assumptions
Description	Low quality foraging habitat for Carnaby's	Identified as low quality by ELA 2021a
Area	37.7 ha	Clearing of foraging habitat within Disturbance Footprint
Quality	3	Low quality foraging habitat outside of the breeding range of Carnaby's Cockatoo. Suitable foraging species present but at a low density (i.e. foliage cover of preferred species <10%)
Information source	ELA 2021a	Flora & fauna survey including targeted Carnaby's Cockatoo habitat assessment
Proposed offset	Rehabilitation with known CBC foraging species	Rehabilitation of 12 ha within the Disturbance Footprint in accordance with the ROMP.
Time over which loss is averted	20 years	Assume maximum time as no further clearing envisaged for the pipeline
Time until ecological benefit	5 years	Conservative estimate of how long it will take until benefits are realised from implementation of the ROMP.

Parameter	Input	Assumptions
Start area	12 ha	Rehabilitation of 12 ha within the Disturbance Footprint in accordance with the ROMP.
Start quality	1	Quality assumed as 1 given completed cleared to facilitate Proposed Action
Risk of loss without offset	5%	Low risk of complete loss through incremental degradation by construction and operation activities.
Future quality without offset	1	Potential for natural regeneration, however likely to be highly impacted by weed spread etc. if left with no management.
Risk of loss with offset	3%	With the offset, there is still some risk of complete loss, but this is lower than without the offset due to management of the site in accordance with the ROMP.
Future quality with offset	3	Rehabilitation is intended to improve the quality of habitat.
Confidence in result (area of offset)	90%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
% IMPACT OFFSET		**15.64%**

Table 8-2: EPBC Act Offset Calculator for Carnaby's Cockatoo habitat acquisition

Parameter	Input	Assumptions
Description	Low quality foraging habitat for CBC	Identified as low quality by ELA 2021a
Area	37.7	Clearing of foraging habitat within Disturbance Footprint
Quality (scale 0-10)	3	Low quality foraging habitat outside of the breeding range of Carnaby's Cockatoos. Suitable foraging species present but at a low density (i.e. foliage cover of preferred species <10%)
Information source	ELA 2021a	Flora & fauna survey including targeted Black Cockatoo habitat assessment
Proposed offset	Acquisition, transfer to a conservation covenant and management in perpetuity	Acquisition of 65 ha of comparable low quality foraging habitat for Carnaby's Cockatoo at an offsite location approximately 3 km north of the Development Envelope.
Time over which loss is averted	20 years	Assume maximum time as ceded into a conservation covenant.
Time until ecological benefit	2 years	Conservative estimate of how long it will take until benefits are realised from transfer to a conservation covenant and implementation of maintenance measures.
Start area	65 ha	Acquisition of 65 ha of comparable low quality foraging habitat for Carnaby's Cockatoo
Start quality (scale 0-10)	3	Comparable quality rating to habitat being cleared. Low quality foraging habitat outside of the breeding range of CBC (Mattiske 2021).
Risk of loss without offset	15%	Low-medium risk of complete loss through incremental degradation by existing agricultural activities.
Future quality without offset (scale 0-10)	2	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. Inadvertent clearing, spread of weeds, dieback etc.
Risk of loss with offset	5%	With the offset, there is still some risk of complete loss, but this is lower than without. Loss could occur

Parameter	Input	Assumptions
		through broader events such as wildfire, climate change.
Future quality with offset (scale 0-10)	4	Assumed quality improvement through implementation of maintenance measures such as weed control, pest management and/or fencing (as required).
Confidence in result (area of offset)	90%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
% IMPACT OFFSET		**92.62%**

8.1.2 Sandplain Duck Orchid (*Paracaleana dixonii)*

The Proposal will result in the loss of up to 79.7 ha of potential habitat for *Paracaleana dixonii* from the Disturbance Footprint (listed as Endangered under the EPBC Act and Vulnerable under the BC Act). This accounts for 2.23% of the potential habitat mapped within the broader local area.

Calculations have been run using the EPBC offset calculator to determine how the proposed conservation gains may correlate to and adequately compensate for the impact to potential *Paracaleana dixonii* habitat. EPBC offset calculations are provided in Attachment A, with justification for the input values detailed below in Table 8-3 and Table 8-4.

Based on a combination of rehabilitation within the Disturbance Envelope and the acquisition and protection in perpetuity of comparable potential *Paracaleana dixonii* habitat, the proposed offset package will directly offset approximately 94.8% of the residual impact of the Proposed Action on *Paracaleana dixonii*. The remainder of the offset will consist of indirect offsets as detailed in Section 5.

Table 8-3: EPBC Act Offset Calculator for *Paracaleana dixonii* habitat rehabilitation

Parameter	Input	Assumptions
Description	Clearing of AcEbHh, EtAhHh, AcDdMl, EtBaHh vegetation communities in Excellent condition	Identified as potential supporting habitat for *Paracaleana dixonii* (ELA 2021a)
Area	79.7 ha	Clearing of potential *Paracaleana dixonii* habitat within the Disturbance Footprint.
Quality	4	No individual plants have been recorded during recent surveys; however it is recognised that vegetation communities within the Development Envelope may potentially provide suitable habitat. Noted the habitat quality has been impacted by bushfire.
Information source	ELA 2021a	Flora & fauna survey including targeted *Paracaleana dixonii* assessment
Proposed offset	Rehabilitation	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
Time over which loss is averted	20 years	Assume maximum time as no further clearing envisaged for the pipeline
Time until ecological benefit	5 years	Conservative estimate of how long it will take until benefits are realised from implementation of the ROMP.

Parameter	Input	Assumptions
Start area	30 ha	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
Start quality	1	Quality assumed as 1 given completed cleared to facilitate Proposed Action
Risk of loss without offset	5%	Low risk of complete loss through incremental degradation by construction and operation activities.
Future quality without offset	1	Potential for natural regeneration, however likely to be highly impacted by weed spread etc. if left with no management.
Risk of loss with offset	3%	With the offset, there is still some risk of complete loss, but this is lower than without due to management of the site in accordance with the ROMP.
Future quality with offset	3	Rehabilitation is intended to improve quality of habitat.
Confidence in result (area of offset)	90%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
% IMPACT OFFSET		**14.06%**

Table 8-4: EPBC Act Offset Calculator for *Paracaleana dixonii* habitat acquisition

Parameter	Input	Assumptions
Description	Clearing of AcEbHh, EtAhHh, AcDdMl, EtBaHh vegetation communities in Excellent condition	Identified as potential supporting habitat for *Paracaleana dixonii* (ELA 2021a)
Area	79.7 ha	Clearing of potential *Paracaleana dixonii* habitat within Disturbance Footprint
Quality (scale 0-10)	4	No individual plants have been recorded during recent surveys; however it is recognised that vegetation communities within the Development Envelope may potentially provide suitable habitat. Noted the habitat quality has been impacted by bushfire.
Information source	ELA 2021a	Flora & fauna survey including targeted *Paracaleana dixonii* survey
Proposed offset	Acquisition, transfer to a conservation covenant and management in perpetuity	Acquisition of 153 ha of potential habitat for *Paracaleana dixonii* at an off-site location approximately 3 km north of the Development Envelope.
Time over which loss is averted	20 years	Assume maximum time as land to be transferred into a conservation covenant and managed in perpetuity.
Time until ecological benefit	2 years	Conservative estimate of how long it will take until benefits are realised from transfer to conservation estate and implementation of maintenance measures.
Start area	153 ha	Acquisition of 153 ha of potential *Paracaleana dixonii* habitat
Start quality (scale 0-10)	4	Comparable quality rating to habitat being cleared.
Risk of loss without offset	15%	Low-medium risk of complete loss through incremental degradation by existing agricultural activities.
Future quality without offset (scale 0-10)	3	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.

Parameter	Input	Assumptions
Risk of loss with offset	5%	With the offset, there is still some risk of complete loss, but this is lower than without. Loss could occur through broader events such as wildfire, climate change.
Future quality without offset (scale 0-10)	5	Assumed quality improvement through implementation of maintenance measures such as weed control, pest management and/or fencing (as required).
Confidence in result (area of offset)	90%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
% IMPACT OFFSET		**80.74%**

8.2 WA Offsets Assessment

The WA offset calculator has been consulted to provide an offset assessment guide (parameters) associated with the clearing of the Carnaby's Cockatoo foraging habitat and impacts to *Paracaleana dixonii* and the two priority flora species.

8.2.1 Carnaby's Cockatoo

Calculations have been conducted using the DWER WA environmental offsets calculator to determine how the proposed conservation gains may correlate to and adequately compensate for the impact to Carnaby's Cockatoo habitat. WA offset calculations are provided in Attachment B, with justification for the input values detailed below in Table 8-5:

Based on a combination of rehabilitation within the Disturbance Footprint and the acquisition and protection in a conservation covenant of comparable Carnaby's Cockatoo habitat, the proposed offset package will directly offset approximately 117.9% of the residual impact of the Proposal on Carnaby's Cockatoo.

Table 8-5: DWER WA Offsets Calculator for Carnaby's Cockatoo

	Parameter	Input	Assumptions
Impact	Description	Low quality foraging habitat for CBC	Identified as low quality by ELA 2021
	Area	37.7 ha	Clearing of foraging habitat within Disturbance Footprint
	Quality (scale 0-10)	3	Low quality foraging habitat outside of the breeding range of Carnaby's Cockatoo. Suitable foraging species present but at a low density (i.e. foliage cover of preferred species <10%)
	Information source	ELA 2021	Flora & fauna survey including targeted BC habitat assessment
Rehabilitation	Proposed offset	Rehabilitation with known CBC foraging species	Rehabilitation of 12 ha within the Disturbance Footprint in accordance with the ROMP.
	Start area	12 ha	Rehabilitation of 12 ha within the Disturbance Footprint in accordance with the ROMP.
	Start quality	1	Quality assumed as 1 given completed cleared to facilitate proposed action
	Future quality without rehabilitation	1	Potential for natural regeneration, however likely to be highly impacted by weed spread etc. if left with no management.
	Future quality with offset (scale 0-10)	3	Rehabilitation is intended to improve quality of habitat.

	Parameter	Input	Assumptions
	Time until ecological benefit	5	Conservative estimate of how long it will take until benefits are realised from implementation of the ROHP.
	Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Offset	Proposed offset	Acquisition and transfer info conservation covenant.	Acquisition of 65 ha of comparable low quality foraging habitat for Carnaby's Cockatoo at an offsite location approximately 3 km north of the Development Envelope.
	Start area	65 ha	Acquisition, transfer to conservation covenant and maintenance of 65 ha of offsite low quality foraging habitat for CBC
	Start quality	3	Comparable quality rating to habitat being cleared. Low quality foraging habitat outside of the breeding range of Carnaby's Cockatoo (Mattiske 2021).
	Future quality without offset (scale 0-10)	2	Decreased quality assumed due to the potential for degradation of habitat from existing agricultural activities i.e. inadvertent clearing, spread of weeds, dieback etc.
	Future quality with offset (scale 0-10)	4	Assumed quality improvement through implementation of maintenance measures such as weed control, pest management and/or fencing (as required).
	Time until ecological benefit	2	Conservative estimate of how long it will take until benefits are realised from transfer into conservation covenant and implementation of maintenance measures.
	Confidence in result	80%	High level of confidence in success of the offset as will be transferred into conservation covenant.
	Duration of offset implementation (maximum 20 years)	20 years	Assume maximum time as ceded into conservation covenant.
	Time until offset secured (years)	1	Assume it will take approximately 12 months to purchase and transfer the offset into conservation covenant.
	Risk of loss without offset	15%	Low-medium risk of complete loss through incremental degradation by existing agricultural activities.

	Parameter	Input	Assumptions
	Risk of loss with offset	5%	With the offset, there is still some risk of complete loss, but this is lower than without. Loss could occur through broader events such as wildfire, climate change.

8.2.2 Sandplain Duck Orchid (*Paracaleana dixonii)*

Calculations have been run using the DWER WA environmental offsets calculator to determine how the proposed conservation gains may correlate to and adequately compensate for the impact to potential *Paracaleana dixonii* habitat. WA offset calculations are provided in Attachment B, with justification for the input values detailed below in Table 8-6.

Based on a combination of rehabilitation within the Disturbance Envelope and the acquisition and protection in perpetuity of comparable potential *Paracaleana dixonii* habitat, the proposed offset package will directly offset approximately 101.9% of the residual impact of the Proposed Action on *Paracaleana dixonii*.

Table 8-6: DWER WA Offsets Calculator for *Paracaleana dixonii*

	Parameter	Input	Assumptions
Impact	Description	Clearing of AcEbHh, EtAhHh, AcDdMl, EtBaHh vegetation communities in Excellent condition	Identified as potential supporting habitat for *Paracaleana dixonii* (ELA 2021a)
	Area	79.7 ha	Clearing of potential *Paracaleana dixonii* habitat within the Disturbance Footprint.
	Quality (scale 0-10)	4	Only one plant has been recorded during recent surveys; however it is recognised that vegetation communities within the Development Envelope may potentially provide suitable habitat. Noted the habitat quality has been impacted by bushfire.
	Information source	ELA 2021a	Flora & fauna survey including targeted *Paracaleana dixonii* assessment
Rehabilitation	Proposed offset	Rehabilitation	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
	Start area	30 ha	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
	Start quality	1	Quality assumed as 1 given completed cleared to facilitate proposed action

	Parameter	Input	Assumptions
	Future quality without rehabilitation	1	Potential for natural regeneration, however likely to be highly impacted by weed spread etc. if left with no management.
	Future quality with offset (scale 0-10)	3	Rehabilitation is intended to improve quality of habitat.
	Time until ecological benefit	5	Conservative estimate of how long it will take until benefits are realised from implementation of the ROMP.
	Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Offset	Proposed offset	Acquisition and transfer info conservation covenant.	Acquisition of 153 ha of potential habitat for *Paracaleana dixonii* at an off-site location approximately 3 km north of the Development Envelope.
	Start area	163 ha	Acquisition of 153 ha of potential habitat for *Paracaleana dixonii*.
	Start quality	4	Comparable quality rating to habitat being cleared.
	Future quality without offset (scale 0-10)	3	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.
	Future quality with offset (scale 0-10)	5	Assumed quality improvement through implementation of maintenance measures such as weed control, pest management and/or fencing (as required).
	Time until ecological benefit	2	Conservative estimate of how long it will take until benefits are realised from transfer to conservation covenant and implementation of maintenance measures.
	Confidence in result	80%	High level of confidence in success of the offset as will be transferred into conservation covenant
	Duration of offset implementation (maximum 20 years)	20 years	Assume maximum time as ceded into conservation covenant
	Time until offset secured (years)	1	Assume it will take approximately 12 months to purchase and transfer the offset into a conservation covenant.

	Parameter	Input	Assumptions
	Risk of loss without offset	15%	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.
	Risk of loss with offset	5%	With the offset, there is still some risk of complete loss, but this is lower than without. Loss could occur through broader events such as wildfire, climate change.

8.2.3 *Lasiopetalum ogilvieanum*

Calculations have been run using the DWER WA environmental offsets calculator to determine how the proposed conservation gains may correlate to and adequately compensate for the impact to potential *Lasiopetalum ogilvieanum* habitat. WA offset calculations are provided in Attachment B, with justification for the input values detailed below in Table 8-7.

Based on a combination of rehabilitation within the Disturbance Envelope and the acquisition and protection in perpetuity of comparable potential *Lasiopetalum ogilvieanum* habitat, the proposed offset package will directly offset approximately 101.3% of the residual impact of the Proposed Action on *Lasiopetalum ogilvieanum*.

Table 8-7: DWER WA Offsets Calculator for *Lasiopetalum ogilvieanum*

	Parameter	Input	Assumptions
Impact	Description	Clearing of suitable vegetation communities in Excellent condition	Identified as potential supporting habitat for *Lasiopetalum ogilvieanum* (ELA 2021a)
	Area	73.80 ha	Clearing of potential *Lasiopetalum ogilvieanum* habitat within the Disturbance Footprint.
	Quality (scale 0-10)	4	Vegetation communities within the Development Envelope may potentially provide suitable habitat. Noted the habitat quality has been impacted by bushfire.
	Information source	ELA 2021a	Flora & fauna survey
Rehabilitation	Proposed offset	Rehabilitation	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
	Start area	30 ha	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
	Start quality	1	Quality assumed as 1 given completed cleared to facilitate proposed action

	Parameter	Input	Assumptions
	Future quality without rehabilitation	1	Potential for natural regeneration, however likely to be highly impacted by weed spread etc. if left with no management.
	Future quality with offset (scale 0-10)	3	Rehabilitation is intended to improve quality of habitat.
	Time until ecological benefit	5	Conservative estimate of how long it will take until benefits are realised from implementation of the ROMP.
	Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Offset	Proposed offset	Acquisition and transfer info conservation covenant.	Acquisition of 135 ha of potential habitat for *Lasiopetalum ogilvieanum* at an off-site location approximately 3 km north of the Development Envelope.
	Start area	135 ha	Acquisition of 135 ha of potential habitat for *Lasiopetalum ogilvieanum.*
	Start quality	4	Comparable quality rating to habitat being cleared.
	Future quality without offset (scale 0-10)	3	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.
	Future quality with offset (scale 0-10)	5	Assumed quality improvement through implementation of maintenance measures such as weed control, pest management and/or fencing (as required).
	Time until ecological benefit	2	Conservative estimate of how long it will take until benefits are realised from transfer to conservation covenant and implementation of maintenance measures.
	Confidence in result	80%	High level of confidence in success of the offset as will be transferred into conservation covenant
	Duration of offset implementation (maximum 20 years)	20 years	Assume maximum time as ceded into conservation covenant
	Time until offset secured (years)	1	Assume it will take approximately 12 months to purchase and transfer the offset into a conservation covenant.

	Parameter	Input	Assumptions
	Risk of loss without offset	15%	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.
	Risk of loss with offset	5%	With the offset, there is still some risk of complete loss, but this is lower than without. Loss could occur through broader events such as wildfire, climate change.

8.2.4 *Banksia scabrella*

Calculations have been run using the DWER WA environmental offsets calculator to determine how the proposed conservation gains may correlate to and adequately compensate for the impact to potential *Banksia scabrella* habitat. WA offset calculations are provided in Attachment B, with justification for the input values detailed below in Table 8-8.

Based on a combination of rehabilitation within the Disturbance Envelope and the acquisition and protection in perpetuity of comparable potential *Banksia scabrella* habitat, the proposed offset package will directly offset approximately 100.4% of the residual impact of the Proposed Action on *Banksia scabrella*.

Table 8-8: DWER WA Offsets Calculator for *Banksia scabrella*

	Parameter	Input	Assumptions
Impact	Description	Clearing of suitable vegetation communities in Excellent condition	Identified as potential supporting habitat for *Banksia scabrella* (ELA 2021a)
	Area	82.70 ha	Clearing of potential *Banksia scabrella* habitat within the Disturbance Footprint.
	Quality (scale 0-10)	4	Vegetation communities within the Development Envelope may potentially provide suitable habitat. Noted the habitat quality has been impacted by bushfire.
	Information source	ELA 2021a	Flora & fauna survey
Rehabilitation	Proposed offset	Rehabilitation	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
	Start area	30 ha	Rehabilitation of 30 ha within the Disturbance Footprint in accordance with the ROMP.
	Start quality	1	Quality assumed as 1 given completed cleared to facilitate proposed action

	Parameter	Input	Assumptions
	Future quality without rehabilitation	1	Potential for natural regeneration, however likely to be highly impacted by weed spread etc. if left with no management.
	Future quality with offset (scale 0-10)	3	Rehabilitation is intended to improve quality of habitat.
	Time until ecological benefit	5	Conservative estimate of how long it will take until benefits are realised from implementation of the ROMP.
	Confidence in result (quality of offset)	80%	High level of confidence in successfully undertaking rehabilitation given the mechanisms proposed and the Proponent's track record with similar commitments.
Offset	Proposed offset	Acquisition and transfer info conservation covenant.	Acquisition of 153 ha of potential habitat for *Banksia scabrella* at an off-site location approximately 3 km north of the Development Envelope.
	Start area	153 ha	Acquisition of 153 ha of potential habitat for *Banksia scabrella.*
	Start quality	4	Comparable quality rating to habitat being cleared.
	Future quality without offset (scale 0-10)	3	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.
	Future quality with offset (scale 0-10)	5	Assumed quality improvement through implementation of maintenance measures such as weed control, pest management and/or fencing (as required).
	Time until ecological benefit	2	Conservative estimate of how long it will take until benefits are realised from transfer to conservation covenant and implementation of maintenance measures.
	Confidence in result	80%	High level of confidence in success of the offset as will be transferred into conservation covenant
	Duration of offset implementation (maximum 20 years)	20 years	Assume maximum time as ceded into conservation covenant
	Time until offset secured (years)	1	Assume it will take approximately 12 months to purchase and transfer the offset into a conservation covenant.

	Parameter	Input	Assumptions
	Risk of loss without offset	15%	Decreased quality assumed due to the potential for degradation of habitat from agricultural activities, i.e. inadvertent clearing, spread of weeds, dieback etc.
	Risk of loss with offset	5%	With the offset, there is still some risk of complete loss, but this is lower than without. Loss could occur through broader events such as wildfire, climate change.

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Attachment A: EPBC Act Offset Calculators

Attachment B: WA Offset Calculators

Attachment C: Mattiske Offset Site Survey 2021

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Assessment of Condition of Flora and Vegetation at Lot 10106

Field work summary

Mattiske Consulting Pty Ltd (MCPL) was commissioned in by Australian Gas Infrastructure Group (AGIG) to conduct a reconnaissance field assessment of the potential Flora and Vegetation values present in areas of remnant vegetation of Lot 10106, Figure 1 (see remnant vegetation areas as shadows behind Pre-European vegetation maps). The survey area - Lot 10106 - is located approximately 30 kilometres South-East (SE) of Dongara, Western Australia (WA).

The reconnaissance field assessment of the flora and vegetation of Lot 10106 was undertaken by 2 experienced botanists from MCPL, on the 16th and 17th of November 2021, in accordance with methods outlined in *Technical Guidance – Flora and vegetation surveys for environmental impact assessment* (EPA 2016). Survey sites for Lot 10106 were selected using aerial photographic maps and field observations. A total of seven survey sites were carefully chosen to sample the widest variety of vegetation types within the survey area. Survey sites consisted of un-marked 10 x 10 metre relevé quadrats. As this assessment was to enable the consideration of an offset package, the need to undertake an extensive and comprehensive assessment was considered unwarranted.

Threatened and priority flora species

Thirteen threatened flora species pursuant to Part 2, Division 1, Subdivision 2 of the BC Act and as listed by DBCA (2021), and pursuant to section 179 of the *Environment Protection and Biodiversity Conservation Act 1999* and as listed by the DAWE (2021), have the potential to occur in the proposed survey area. A total of 21 priority flora species, including three priority one, four priority two, ten priority three and four priority four species as listed by the Western Australian Herbarium [WAH] (1998-2021) have the potential to occur in the proposed survey area.

Of the potential 24 Threatened (T) and Priority (P) flora, five species have previously been recorded in nine locations within Lot 10106 (Figure 2). Four of the known locations were visited during the fieldwork in November 2021.

Daviesia speciosa (T) was located in a healthy population at a previously recorded location. The *Paracaleana dixonii* (T) location visited had recently been burnt and no specimens were observed. Two previous locations of *Thelymitra stellata* were visited, one had no specimens found and the other a specimen of *Thelymitra* in late fruiting stage was found but can only by identified to genus.

There are four potential priority specimens collected with identifications outstanding. These are *Tricoryne soullierae* (P1) (Range Extension), *Stylidium drummondianum* (P3), *Stylidium torticarpum* (P3) (Range Extension) and *Banksia scabrella* (P4). None of these have previously been recorded in Lot 10106 but *Stylidium drummondianum* (P3) and *Banksia scabrella* (P4) are known from the area.

Vegetation Condition and Diversity

All 7 sites were recorded as pristine or excellent condition. There were two additional locations noted with disturbance including the encroachment of weed species. These locations were isolated and require other remediation efforts such as removal of waste to be returned to a natural state. The eastern block of vegetation has been partially burnt within the last 5 years but the vegetation is regenerating. The boundaries of both native vegetation blocks have some weed intrusion as a result of firebreaks and adjacent farmland.

Within the 7 relevé quadrats 103 species were found. Each of the seven sites were completed in different communities with five different heath communities, one open forest and one woodland recorded. Two of the sites were burnt (B) within 5 years (Photographs 1-5).

H1 Heathland of *Melaleuca concreta*, *Gastrolobium plicatum*, *Melaleuca marginata* and *Allocasuarina campestris* with isolated clumps of mallee *Eucalyptus arachnaea* subsp*. arachnaea* over *Lepidosperma* ?sp. Bandalup Scabrid (N. Evelegh 10798) and *Stylidium torticarpum* (P3) on clay slopes.

H2(B) Open Heathland of *Melaleuca systena*, *Scholtzia laxiflora* and *Pileanthus filifolius* over an open sedgeland of *Mesomelaena pseudostygia*, *Ecdeiocolea monostachya* and *Lepidobolus* sp. with emergent *Xylomelum angustifolium* and *Eucalyptus todtiana* on grey clay sand dunes.

H3 Closed Heathland of *Melaleuca aspalathoides*, *Petrophile shuttleworthiana* and *Hakea auriculata* over a sedgeland of *Ecdeiocolea monostachya* over mixed forbs on grey clay sand upper slopes.

H4 Heathland of *Calothamnus longissimus*, *Melaleuca carrii* and *Banksia fraseri* over *Ecdeiocolea monostachya* and *Conostylis androstemma* on low laterite breakaway.

H5(B) Heathland of *Hibbertia hypericoides*, *Melaleuca aspalathoides* and *Melaleuca leuropoma* over *Desmocladus asper* and mixed shrubs with occasional *Allocasuarina campestris* on low grey sand dunes.

F1 Open Forest of *Eucalyptus wandoo*, over open shrubland of *Melaleuca concreta*, *Rhagodia preissii* and *Gastrolobium plicatum* over *Acacia* sp., *Desmocladus asper* and *Acanthocarpus canaliculatus* on brown sandy clay loam slopes.

W1 Open Woodland of *Eucalyptus todtiana* over an open Shrubland of *Banksia leptophylla*, *Eremaea beaufortioides, Calothamnus sanguineus* and *Hibbertia hypericoides* over mixed low shrubs and forbs on low grey sand dunes.

Three species of weeds were recorded. These are **Lysimachia arvensis, *Ursinia anthemoides* and **Ehrharta calycina.* These species were found only in low numbers in two sites. Of these weed species, the first two species

tend to only establish in disturbed areas, the **Ehrharta calycina* has the potential to spread into areas of vegetation if the vegetation canopy is opened up through fire or disturbance.

Conclusion

The extent of the remnant vegetation is illustrated as shadows behind the Pre-European data on Figure 1. There are multiple diverse communities which at a community level are more complex than that illustrated at a regional scale using Pre-European vegetation mapping (Figure 1), Threatened and Priority flora and low weed incursion from adjacent farmland. The variable soil and landforms including low sand dunes and laterite breakaways encourage the local floristic diversity. The Department of Biodiversity, Conservation and Attractions locations of Threatened and Priority flora is summarized on Figure 2. The range of species illustrated both within the remnant vegetation areas on Lot 10106 and on nearby similar soils and landforms reflects the significance of the potential for the remnant native vegetation within the property. The variety of flora recorded in the brief site inspection is also summarized in Appendix A attached to reflect the diversity of species present.

The remnant areas of native vegetation of Lot 10106 have a high floristic value. Whilst these remnants are only part of the property, on the basis of the findings from desktop investigations and the brief site inspection it is recommended that the remnants of native vegetation support a significant range of biological values that should be used in offset considerations.

Ms Louisa Cockram & Dr Libby Mattiske

Mattiske Consulting Pty Ltd

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Attachments

Photographs 1-5:	PHOTOGRAPHS FROM LOT 10106
Appendix A:	VASCULAR PLANT SPECIES WITH THE POTENTIAL TO OCCUR AND THOSE RECORDED WITHIN THE REMNANT VEGETATION OF LOT 10106
Figure 1:	PRE-EUROPEAN VEGETATION
Figure 2:	LANDSCAPE SOIL MAPPING & DBCA FLORA

Photographs from Lot 10106

Photograph 1: Vegetation Community H1, Heathland on clay slopes

Photograph 2: Vegetation Community H4, Heathland on low breakaways

Photographs from Lot 10106

Photograph 3: Vegetation Community H5, Heathland on low sand dunes

Photograph 4: Vegetation Community F1, Open Forest on brown sandy clay loam slopes

Photographs from Lot 10106

Photograph 5: Vegetation Community W1, Woodland on low sand dunes

APPENDIX A: VASCULAR PLANT SPECIES WITH THE POTENTIAL TO OCCUR AND THOSE RECORDED WITHIN THE REMNANT VEGETATION OF LOT 10106

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora

SCC= State conservation code; FCC = Federal conservation code; CE = Critically Endangered; E = Endangered.

FAMILY		SPECIES	SCC	FCC[1]	EPBC[2]	NATUREMAP[3]	DBCA FLORA RECORD[4]	2021 Releve
AMARANTHACEAE		*Ptilotus stirlingii* subsp. *stirlingii*				X		
APIACEAE		*Trachymene pilosa*						X
ASPARAGACEAE		*Acanthocarpus canaliculatus*				X		X
	*	*Asparagus asparagoides*			X			
		Laxmannia sessiliflora subsp. *drummondii*				X		
ASTERACEAE		*Olearia revoluta*						X
		Podotheca gnaphalioides				X		
	*	*Ursinia anthemoides*						X
		Waitzia acuminata						X
CASUARINACEAE		*Allocasuarina campestris*						X
		Allocasuarina microstachya						X
CHENOPODIACEAE		*Rhagodia preissii* subsp. *preissii*						X
COLICHICACEAE		*Burchardia congesta*						X
		Wurmbea tubulosa	T	EN	X			
CYPERACEAE		*Caustis dioica*						X
		Lepidosperma ?sp. Bandalup Scabrid (N. Evelegh 10798)						X
		Lepidosperma sp.						X
		Mesomelaena pseudostygia						X
		Mesomelaena stygia subsp. *deflexa*	P3				X	
		Schoenus badius	P2			X		
		Schoenus clandestinus						X
		Schoenus sp.						X
DILLENIACEAE		*Hibbertia hypericoides*						X
		Hibbertia hypericoides subsp. *hypericoides*						X
		Hibbertia subvaginata						X
DROSERACEAE		*Drosera eneabba*						X
ECDEIOCOLEACEAE		*Ecdeiocolea monostachya*						X
ERICACEAE		*Conostephium preissii*				X		
		Leucopogon inflexus						X
		Lissanthe powelliae				X		
		Lysinema pentapetalum						X
		Styphelia insularis						X
		Styphelia marginata	T	EN	X			
		Styphelia obtectus	T	EN	X			
		Styphelia serratifolia				X		
		Styphelia tortifolia						X

APPENDIX A: VASCULAR PLANT SPECIES WITH THE POTENTIAL TO OCCUR AND THOSE RECORDED WITHIN THE REMNANT VEGETATION OF LOT 10106

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora

SCC= State conservation code; FCC = Federal conservation code; CE = Critically Endangered; E = Endangered.

FAMILY	SPECIES	SCC	FCC[1]	EPBC[2]	NATUREMAP[3]	DBCA FLORA RECORD[4]	2021 Releve
EUPHORBIACEAE	*Beyeria gardneri*	P3				X	
	Monotaxis bracteata				X		
FABACEAE	*Acacia auronitens*				X		
	Acacia bidentata				X		
	Acacia lanceolata	P3			X		
	Acacia pulchella						X
	Acacia stenoptera				X		
	Acacia sp.						X
	Chorizema humile	T	EN	X			
	Daviesia divaricata						X
	Daviesia speciosa	T	EN		X		
	Gastrolobium plicatum						X
	Jacksonia angulata				X		
	Jacksonia foliosa				X		
GOODENIACEAE	*Dampiera carinata*						X
	Dampiera spicigera				X		X
HAEMODORACEAE	*Anigozanthos humilis*						X
	Anigozanthos pulcherrimus						X
	Conostylis androstemma						X
	Conostylis canteriata				X		
	Conostylis crassinerva						X
	Conostylis dielsii subsp. *teres*	T	EN	X			
	Conostylis micrantha	T	EN	X			
	Haemodorum spicatum						X
	Macropidia fuliginosa				X		
HALORAGACEAE	*Glischrocaryon aureum*						X
HEMEROCALLIDACEAE	*Tricoryne* sp.						X
	Chamaescilla corymbosa						X
	Stawellia dimorphantha	P4				X	
LAMIACEAE	*Hemiandra gardneri*	T	EN	X			
	Hemiphora bartlingii						X
	Pityrodia viscida	P4				X	
	Cassytha sp.						X
MALVACEAE	*Guichenotia alba*	P3			X		
	Guichenotia micrantha				X		
	Guichenotia sp.						X
	Lasiopetalum drummondii				X		X
	Lasiopetalum erectifolium				X		
	Lasiopetalum ogilvieanum	P1			X		

APPENDIX A: VASCULAR PLANT SPECIES WITH THE POTENTIAL TO OCCUR AND THOSE RECORDED WITHIN THE REMNANT VEGETATION OF LOT 10106

Note: * denotes introduced species; T denotes threatened flora and P1-P4 denote priority flora

SCC= State conservation code; FCC = Federal conservation code; CE = Critically Endangered; E = Endangered.

FAMILY	SPECIES	SCC	FCC[1]	EPBC[2]	NATUREMAP[3]	DBCA FLORA RECORD[4]	2021 Releve
MYRTACEAE	*Babingtonia erecta*						X
	Calothamnus longissimus						X
	Calothamnus sanguineus						X
	Calytrix fraseri				X		X
	Eremaea beaufortioides						X
	Eremaea violacea				X		
	Eucalyptus ×impensa	T	EN	X			
	Eucalyptus abdita	P2				X	
	Eucalyptus arachnaea subsp. *arachnaea*						X
	Eucalyptus conveniens				X		
	Eucalyptus crispata	T	VN				
	Eucalyptus macrocarpa × pyriformis	P3				X	
	Eucalyptus macrocarpa subsp. *elachantha*	P4				X	
	Eucalyptus macrocarpa subsp. macrocarpa						X
	Eucalyptus redunca subsp. *pluricaulis*				X		
	Eucalyptus todtiana						X
	Eucalyptus wandoo						X
	Eucalyptus leprophloia	T	EN			X	
	Leptospermum oligandrum						X
	Malleostemon decipiens	P1				X	
	Melaleuca marginata						X
	Melaleuca aspalathoides						X
	Melaleuca carrii						X
	Melaleuca concreta						X
	Melaleuca leuropoma						X
	Melaleuca radula						X
	Melaleuca systena						X
	Micromyrtus rogeri	P1				X	
	Pileanthus filifolius						X
	Scholtzia laxiflora				X		X
	Thryptomene nitida	P3				X	
	Verticordia blepharophylla				X		
	Verticordia densiflora						X
	Verticordia grandis				X		X
	Verticordia huegelii var. *stylosa*				X		
	Verticordia luteola var. *luteola*	P3			X		
	Verticordia nobilis						X
	Verticordia pennigera				X		X
ORCHIDACEAE	*Paracaleana dixonii*	T	EN		X		
	Prasophyllum cyphochilum				X		
	Thelymitra sp.						X
	Thelymitra stellata	T	EN		X		
PITTOSPORACEAE	*Marianthus ringens*				X		

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POACEAE		*Amphipogon caricinus* var*. caricinus*						X
	*	*Cenchrus ciliaris*			X			
	*	*Ehrharta calycina*						X
		Neurachne alopecuroidea						X
POLYGALACEAE		*Comesperma griffinii*	P2				X	
		Comesperma rhadinocarpum					X	
PRIMULACEAE	*	*Lysimachia arvensis*						X
PROTEACEAE		*Banksia fraseri*						X
		Banksia leptophylla						X
		Banksia nivea						X
		Banksia scabrella	P4			X		X
		Banksia sessilis						X
		Banksia shuttleworthiana						X
		Conospermum boreale				X		
		Conospermum boreale subsp. *ascendens*				X		
		Conospermum boreale subsp*. boreale*				X		
		Conospermum brachyphyllum				X		
		Conospermum triplinervium						X
		Conospermum wycherleyi subsp*. glabrum*				X		
		Grevillea candelabroides				X		
		Grevillea shuttleworthiana subsp. *shuttleworthiana*				X		
		Hakea auriculata				X		X
		Hakea candolleana						X
		Hakea circumalata				X		
		Hakea cygnus subsp. *cygnus*				X		
		Hakea lissocarpha				X		X
		Hakea polyanthema				X		X
		Hakea ruscifolia						X
		Hakea stenocarpa						X
		Isopogon tridens						X
		Lambertia multiflora var. *multiflora*				X		
		Persoonia comata				X		
		Persoonia rudis	P3			X		
		Petrophile chrysantha						X
		Petrophile drummondii						X
		Petrophile scabriuscula				X		
		Petrophile shuttleworthiana						X
		Stirlingia latifolia						X
		Synaphea oulopha	P3				X	
		Synaphea sparsiflora	P2			X		
		Xylomelum angustifolium						X

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FAMILY		SPECIES	SCC	FCC[1]	EPBC[2]	NATUREMAP[3]	DBCA FLORA RECORD[4]	2021 Releve
RESTIONACEAE		*Desmocladus asper*						X
		Desmocladus semiplanus						X
		Lepidobolus preissianus						X
RHAMNACEAE		*Stenanthemum notiale*						X
RUBIACEAE		*Opercularia vaginata*						X
RUTACEAE		*Boronia cymosa*						X
		Cyanothamnus coerulescens				X		
		Diplolaena eneabbensis				X		
		Diplolaena ferruginea				X		
		Diplolaena sp.						X
SANTALACEAE		*Santalum* sp.						X
SAPINDACEAE		*Diplopeltis huegelii* subsp. *subintegra*				X		
SOLANACEAE	*	*Lycium ferocissimumis*			X			
STYLIDACEAE		*Stylidium adpressum*				X		X
		Stylidium bicolor				X		
		Stylidium drummondianum	P3			X		X
		Stylidium miniatum						X
		Stylidium ponticulus				X		
		Stylidium purpureum						X
		Stylidium repens				X		X
		Stylidium rigidulum				X		
		Stylidium sp.				X		
		Stylidium torticarpum	P3					X
TAMARICACEAE	*	*Tamarix aphylla*			X			
XANTHORRHOEACEAE		*Xanthorrhoea drummondii*						X

Attachment D: Extract from Strike West Pty Ltd West Erregulla Field Development Program Offset Strategy (JBS&G 2022)